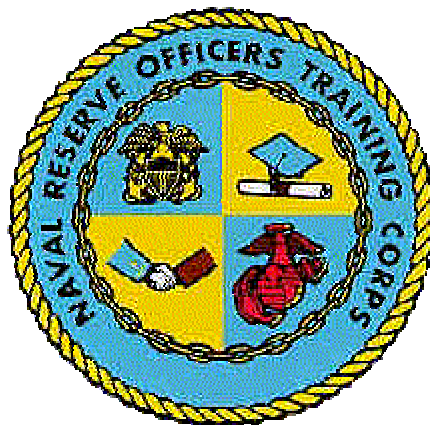


NAVAL RESERVE OFFICERS TRAINING CORPS

NAVAL OPERATIONS AND SEAMANSHIP



August 2005

NAVAL SERVICE TRAINING COMMAND

SF 080502

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

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LETTER OF PROMULGATION

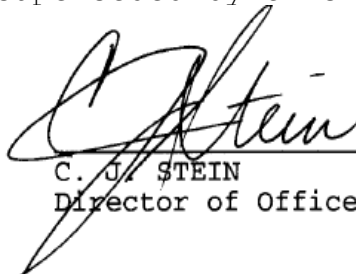
The Naval Operations and Seamanship curriculum guide is designed to be a primary resource to the instructor in preparing lesson plans to ensure a broad yet thorough education in basic surface ship navigation and operations. Regardless of the extent to which the lessons in this curriculum guide are implemented or the number of credit hours offered by the host university for this course, it is the responsibility of the individual NROTC instructor to ensure all Professional Core Competencies related to this topic are adequately attained.

This revision includes material that focuses on the moral and ethical responsibilities of military leaders, as well as the essential attributes of character required for effective leadership. While only a few lessons deal specifically with these issues, instructors should include discussions of leadership in as many lectures as possible.

Wherever possible, alternative teaching methods or in-class exercises have been included with the lessons and laboratory guides.

Instructors should promote critical thinking skills throughout this course of instruction and provide opportunities for students to demonstrate progression in both the cognitive and affective domains. Although this course focuses primarily on the cognitive and offers many opportunities for analysis, synthesis and evaluation, this curriculum can also be instructive in the affective domain as students practice valuing, organizing and internalizing aspects of Navy's culture and methods. Instructors are encouraged to use their own past experiences to illustrate and enrich their classroom instruction.

This course is approved for implementation upon receipt. Navigation II, CNET P1550/2 (04/96), is hereby canceled and superseded by this curriculum guide.


C. J. STEIN
Director of Officer Development

31 August 2005
Date

DEFINITION OF MEASUREMENT TERMS

(Used in describing desired Professional Core Competencies
and supporting learning objectives)

- I. **Know** - Recall facts, bring to mind and recognize the appropriate material.

Examples: Know the objectives of damage control aboard ship.

Know the safety procedures required to provide safe small boat operations.
- II. **Comprehend** - Interpret principles and concepts and relate them to new situations.

Examples: Comprehend the Mission of the U.S. Navy and Marine Corps.

Comprehend the concept of internal forces (e.g., stress, strain, shear).
- III. **Apply** - Utilize knowledge and comprehension of specific facts in new relationships with other facts, theories and principles.

Examples: Apply correct plotting procedures when navigating in pilot waters.

Apply correct procedures to determine times of sunrise and sunset.
- IV. **Demonstrate** - Show acceptable level of ability in performing a task.

Examples: Demonstrate third class swimming skills and fundamental water survival skills.

Demonstrate the correct procedure used in radio-telephone communications.

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PROFESSIONAL CORE COMPETENCY OBJECTIVES

The following professional core competency objectives are from the Professional Core Competency Manual for Officer Accession Programs of April 2001.

- A. The student will know inland and international laws and systems of regulations that govern conduct of vessels in national waters and on the high seas.
 - 1. The student will know the major aspects of the United States' position on International Law of the Sea regarding territorial seas, contiguous zones, high seas, and rights of innocent passage.
 - 2. The student will know the U.S. Inland Rules of the Road and the international regulations for preventing collisions at sea to include:
 - a. The purpose and scope of the rules, including application.
 - b. Terms and definitions used in the rules.
 - c. Steering rules for vessels in sight of each other, including sound signals.
 - d. Lights and day shapes for frequently encountered vessel classes.
 - e. Use of radar and conduct of vessels in reduced visibility, including sound signals.
 - f. Definition of situations falling under "special circumstances."
 - 3. The student will know the purpose and maneuvering rules associated with Traffic Separation schemes established by the International Maritime Consultive Organization (IMCO) agreement.
- B. The student will comprehend the interrelationship between authority, responsibility, and accountability within an organization.
- C. The student will demonstrate, in officer leadership situations, an understanding of the influence of the following on a leader's ability to achieve organizational goals:

1. Use of authority
 2. Degree of delegation and decentralization
 3. Officer-enlisted professional relationships
 4. Chain of command
 5. Morale and esprit de corps
- D. The student will comprehend the ethical and moral responsibilities of a leader, and comprehend the relationship of integrity, moral courage, and ethical behavior to authority, responsibility and accountability.
- E. The student will comprehend the following personal qualities and be able to relate them to a leader's effectiveness:
1. Loyalty
 2. Honor
 3. Integrity
 4. Courage (moral and physical)
- F. The student will know the basic information found in Naval Tactical Publications (NTP), Naval Warfare Publications (NWP), and Allied Tactical Publications (ATP) systems.
- G. The student will know the basic forms of naval communications.
1. The student will know proper radio-telephone terminology and demonstrate proper procedure by simulating a radio-telephone communication, internal shipboard communications and sound-powered phone procedures.
 2. The student will know various methods of visual communications, including flags and pennants, flashing light, and semaphore, and demonstrate procedures for their proper use as outlined below:
 - a. The student will demonstrate a knowledge of international signal flags and allied tactical flaghoist procedures through simulated messages.
 - b. The student will know the use of ATP 1, Volume II, and the International Code of Signals (H.O. 102).
NOTE: Due to the confidential classification of ATP 1, Volume II, instruction on the topic should reflect the nature of the material without compromising its confidentiality.

3. The student will know and be familiar with procedures for effecting communications security (COMSEC), including the common causes of security compromise and safeguards to prevent unauthorized disclosure.
4. The student will comprehend the requirement for operations security (OPSEC) for military forces, including the following elements:
 - a. The student will comprehend the OPSEC process.
 - b. The student will understand the need for OPSEC, including recognition of the OPSEC threat.
 - c. The student will understand the concept of Essential Elements of Friendly Information (EEFI).
 - d. The student will know the protective measures used in OPSEC.
- H. The student will know the basic terms and procedures associated with replenishment at sea (UNREP).
- I. The student will know controllable and non-controllable forces in shiphandling.
 1. The student will know the effects of controllable forces in shiphandling, such as engines, rudders, propellers, lines, anchors and tugs.
 2. The student will know the effects of non-controllable forces in shiphandling, such as wind, current, depth of water, etc.
 3. The student will know the terms associated with tactical data and comprehend how tactical data tables may be employed in planning shiphandling evolutions.
 4. The student will demonstrate procedures and standard terminology in giving engine, rudder, and line handling commands.
 5. The student will demonstrate the techniques for using binoculars, stadimeter, radar, and bearing circles when involved in shiphandling situations.
- J. The student will comprehend relative motion and demonstrate capability to solve problems associated with relative motion.
 1. The student will comprehend the theory of relative motion as graphically displayed by the geographic and relative plot.

2. The student will comprehend the significance of bearing drift, apply bearing drift to determine relative motion, and comprehend the following related terms:
 - a. Relative bearing
 - b. Target angle.
 3. The student will know the terminology and relationship of the speed triangle and the relative plot associated with the maneuvering board.
 4. The student will demonstrate the use of the maneuvering board to accurately:
 - a. Determine the CPA and time of CPA of an approaching vessel.
 - b. Determine the course and speed of a maneuvering ship.
 - c. Determine course, speeds and time for proceeding to a new station or to intercept another vessel.
 - d. Determine true wind direction and velocity.
 - e. Determine course and speed to produce desired wind.
 5. The student will know the principal rules for maneuvering in formation (as per ATP 1, Volume I) and the use of ATP 1, Volume II, and the International Code of Signals (HO-102). (NOTE: Due to the confidential classification of ATP 1, Volume II, instruction in the topic should reflect the nature of the material without compromising its confidentiality. The NROTC Signal Exercise Book is structured similarly for in-class use.)
- K. The student will know the basic characteristics and capabilities of the major weapons systems and platforms of the U.S. naval forces.
1. The student will know the broad tactical implications of the multi-threat environment.
 2. The student will know the significance of intelligence in the application of naval warfare.
- L. The student will know the basic methods which potential adversaries can employ to prevent accomplishment of the sea control and power-projection missions of the United States Naval Services.

- M. The student will know the concept of naval command and control within the armed forces.
 - 1. The student will know the chain of operational command from the National Command Authority to the platform commander.
 - 2. The student will know and be able to discuss the Composite Warfare Commander (CWC) concept, the organization of a typical ship CIC, and understand their interrelationship in formation maneuvering and in accomplishing the ship's warfare mission.
 - 3. The student will know how each of the following components of naval warfare contributes to the basic sea control and power projection missions of the naval service:
 - a. Air warfare
 - b. Undersea warfare (including mine and antisubmarine warfare)
 - c. Surface warfare
 - d. Strike warfare
 - e. Amphibious warfare
 - f. Electronic warfare
 - g. Mobile logistics support
 - h. Special warfare
 - i. Expeditionary warfare
 - j. C⁴I warfare (command, control, communications, computers, and intelligence)
- N. The student will know the basic concepts and philosophies outlined in Joint Pub 1.
 - 1. The student will describe the nature of American Military Power.
 - 2. The student will identify the values in Joint Warfare.

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LESSON TOPICS

LESSON #/TITLE	HOURS
<u>Section I: Advanced Navigation</u>	
1. Rules of the Road/Maneuvering Board Refresher	1
2. Tracking and Interception	1
Laboratory One	1
3. International COLREGS/U.S. Inland Rules: Differences/Special Circumstances and Review	1
4. International Law/Federal Regulations/Naval Operations	2
5. Voyage Planning and Time	1
6. Formations, Dispositions, Screens, & Maneuvering Rules	1
Laboratory Two	1
<u>Section II: Communications</u>	
7. Operational Security	1
8. Visual Communications/Signal Book	1
9. External Communications/Radiotelephone (R/T)	1.5
Laboratory Three	1
10. Tactical Maneuvering Exercise	1
Laboratory Four	1
<u>Section III. Evolutions & Operations</u>	
11. Watchstanding	1
12. Case Study: The Roosevelt/Leyte Gulf Collision	1
13. Shiphandling (Forces/Tugs/Equipment)	1
14. Intended Track and Current Sailing	1
15. Anchoring	1
Laboratory Five	1
16. Maneuvering Board - Wind	1
Laboratory Six	1
17. Evolutions - Underway Replenishment	1
<u>Section IV. Naval Warfare Doctrine/Joint Operations</u>	
18. Naval Command and Control	1
19. Naval Warfare Doctrine (NWD) Series: Introduction	1
20. NWD: Surface Warfare	1
21. NWD: Special Operations/Special Warfare	.5
22. NWD: Air Warfare	1
23. NWD. Undersea Warfare	1
24. NWD: Amphibious Warfare	1
25. Employment of Naval Forces	1
26. Introduction to Joint Organization and Warfare	1
27. Joint Organization and Warfare in the 21 st Century	1
28. Final Battle Scenario	<u>2</u>
Total Hours	36

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LIST OF INSTRUCTIONAL AIDS

I. Videos

- A. The following videos are part of the official curriculum and have previously been distributed to each unit:

1. The Gallant Breed: Marines in Combat, 60 minutes
2. Melbourne/Evans Incident -- I Relieve You, Sir, 1975, #34406, 35 minutes

These videos should be controlled and serialized as part of the unit's inventory of Naval Science training materials to ensure they are available for future courses of instruction. It is the responsibility of the unit to keep track of the location of the videos and to maintain them in good working condition. Replacements for damaged videos may be ordered from the NETPDTC Regional Visual Information Center by contacting Mr. Ron Burk at ron.burk@navy.mil or (850) 452-1001, ext 2020.

- B. Additional video resources will be highlighted throughout the lesson guides as being "optional." These videos are good resources the instructor may find useful. Many of these videos have previously been provided to the units and may be retained for use in this course. Although copies of these will no longer be provided by NSTC, some are available from the NETPDTC Regional Visual Information Center (see paragraph I.A.2. above). Optional video resources for this course include:

1. Seven Minutes that Stunned the Navy, 1993, #N0044397004 (commercial), 50 minutes
2. Amphibious Operations -- Overview, #35731, 40 minutes
3. Basic Elements -- Replenishment at Sea, 1965, #24979, 30 minutes
4. Battle Alert in the Gulf, 1999, #78342128373 (commercial), 60 minutes
5. Carrier Battle Group, The, #760307075, 20 minutes
6. Fast Attack Submarines of Hampton Roads, #N0443950016, 27 minutes

7. Flight Deck (Air Power), #22002 (commercial), 45 minutes
 8. Joint Warfare of the U.S. Armed Forces, #805754, 10 minutes
 9. Naval Doctrine Publication #1, #805972, 19 minutes
 10. Warship, #B0000063KP (commercial), 30 minutes
- C. The following films were previously a part of the Navigation II curriculum, but replacement copies are no longer available. However, units may still have copies on hand that instructors may wish to include in their classroom instruction.
1. Operations Security, 1992, #805459, 10 minutes
 2. Relative Motion and the Maneuvering Board, #24177, 12 minutes
 3. Submarine: Steel Boats -- Iron Men, 27 minutes
- D. Other videos may be obtained from university libraries, online vendors, online in public domain areas (without cost), or purchased by the unit through commercial vendors. There are various online vendors and resources instructors may consult when seeking video resources for educational purposes. Recommended are: (1) resources used by the United States Naval Academy; (2) resources available on various educational institution websites; (3) archived resources at television network web sites; and/or (4) government and military-related issues archived by C-SPAN at <http://www.c-span.org/>. Many resources from these sources are available at little or no cost. The NROTC Course Coordinator may be contacted for assistance in locating video resources.
- E. Most universities have video libraries or audiovisual organizations that can provide current, topical films to units at no cost. These universities may also have additional funding or arrangements to purchase video rights and rental for use in the classroom environment. Consult with your university's film librarian to locate additional films to support lesson plans.
- F. A wide variety of Department of Defense (DOD) materials is available through the Defense Automated Visual Information System/Defense Instructional Technology Information System (DAVIS/DITIS) website at: <http://dodimagery.afis.osd.mil>. This site contains listings and descriptions of thousands of audiovisual productions/videotapes and interactive multimedia

instructional products used by DOD. The NETPDTC Norfolk Regional Electronic Media Center may also be able to provide desired multimedia resources, by contacting Mr. Ron Burk at ron.burk@navy.mil or (850) 452-1001, ext. 2020.

G. **NOTES OF CAUTION:**

1. When purchasing videos from commercial vendors, you must keep in mind that many vendors have a license from the copyright owner to rent or sell the film for home viewing only. Public viewing, including classroom, would be a separate license. Therefore, you must make it clear to the vendor that you intend to use the video for educational purposes/classroom use and ensure the vendor has the authority to sell copyrighted materials for this purpose. It is imperative that there be a written purchase document that indicates to the vendor the intended use of the video, the intended frequency of use, the number of students at a typical viewing, and if the product will be shown in its entirety or only in specific segments, so there will be no doubt in the vendor's mind how the product will be used.
2. Instructors should be aware that commercial videos provided by NSTC or purchased by the unit are for use in an academic setting only. They are not to be reproduced, sold, copied, or shown in their entirety. Academic privileges allow instructors to utilize portions of videos, books, articles available to the public, and other media in academia to teach and educate. Using or distributing these videos in any fashion other than outlined here may constitute copyright infringements. Many short video clips from commercial movies supply the instructor with contemporary, intriguing materials that provide examples of the issues they are trying to teach, but these segments should be used appropriately. Seek official legal advice for any use not mentioned in this guide. Additional guidance may be found in SECNAVINST 5870.4.
3. Note that all personnel must exercise caution in using material downloaded from the Internet. Access to works on the Internet does not automatically mean that these can be reproduced and reused without permission or royalty payment. Before using any materials downloaded from the Internet for use in training, you must determine what, if any, copyright restrictions might apply. A good rule of thumb would be to presume that any

information on the Internet is copyrighted and that you should not use it without obtaining permission from the copyright holder. SECNAVINST 5870.4 provides specific guidelines that should be addressed in the copyright permission request letter.

II. Computer-Aided Instructional Software (optional)

*(*These programs may be found on the STEP/ICW CD-ROMs distributed to all NROTC units by NETPDTC.)*

- A. *Maneuvering Board (CAI0001R1189). UNCLAS, self-paced, test included.
- B. *Navigation Simulator (CAI0005R0389). UNCLAS, self-paced, test included.
- C. *Flags (CAI0003R1189). UNCLAS, self-paced, test included.

An online flag simulator is available at:

<http://www.eskimo.com/cgi-bin/flags>.

- D. Division Officer at Sea Program. Computer-based training, available online at:
<https://wwwcfs.cnet.navy.mil/swos/restricted/Doc/doc.cfm>.) Note: Instructors will have to log onto this website to access material.

III. Instructional Aids

Chalkboard/Whiteboard

Easel

Training Device 6605-00-240-5717: Wall-mounted maneuvering board

Large parallel ruler (chalkboard)

Large dividers 18" (chalkboard)

Videocassette player with monitor

PowerPoint slides with computer/projection system or overhead projector with instructor-prepared transparencies

Slide projector (optional)

Training Device 5LL2: Flag Cards Set
(Available on the Rules of the Road CD, SOBT (SAUF 32628). Also see Flag Sheet included in Lesson 8, Visual Communications, of this curriculum guide.)

Flaghoist trainer (2) 29HP1 (6910-00-523-1518) (optional)

Projection pad (optional)

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"U.S. Navy Signal Flags" (Available at: <http://www.chinfo.navy.mil/navpalib/communications/flags/flags.html>. Also, an online flag simulator is available at <http://www.eskimo.com/cgi-bin/flags>.)

C. Additional Resources (Not provided by NSTC. Many of these resources were required previously or are currently required for other Naval Science courses. Instructors may wish to obtain available materials from the NROTC unit's library before they are removed from inventory. Others may be available in university libraries or online.)

CJCSI 1800.01 (Series), "Officer Professional Military Education Policy," pp. A-A-1 and A-A-2. (Available at: www.au.af.mil/au/awc/opmep/1800_01a.pdf.)

Crenshaw, R. S. Naval Shiphandling. 4th Ed. Annapolis, MD: U.S. Naval Institute Press, 1977.

Department of the Navy. ...From the Sea, Preparing the Naval Service for the 21st Century. Washington, D.C.: GPO, September 1992. (Available online at: <http://www.chinfo.navy.mil/navpalib/policy/fromsea/fromsea.txt>.)

Friedman, Norman. The Naval Institute Guide to World Naval Weapons Systems 1997-98. Annapolis, MD: Naval Institute Press, 1997.

Howe, Neil, and William Strauss. "Military Strategy: Seasons of History." Surface Warfare. Vol. 22, No. 3, May/June 1997, pp. 36-41.

Lambert, Mark, ed. Jane's All the World's Aircraft (current edition). Alexandria, VA: Jane's Information Group.

Naval Orientation (NAVEDTRA 12966).

NWP 4.01.4, "Underway Replenishment." (Supercedes NWP-14)

Sharpe, Richard, CAPT, RN, ed. Jane's Fighting Ships (current edition). Alexandria, VA: Jane's Information Group, Inc.

Sharpe, Richard, CAPT, RN, ed. Jane's Naval Weapons Systems (current edition). Alexandria, VA: Jane's Information Group, Inc.

Smith, Perry M. Taking Charge: A Practical Guide for Leaders. Washington, D.C.: National Defense University Press, 1986.

Stepsis, Joan A. "Conflict-Resolution Strategies." Annual Handbook for Group Facilitators, 1974.

Surface Warfare. Harmony Printing & Development Company, Liberty, MO, July/August 1995.

Wood, Julia T. "Constructive Conflict in Discussions: Learning to Manage Disagreements Effectively." Annual Handbook for Group Facilitators, 1977.

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Where available, websites have been provided to assist instructors

in accessing required and additional resources. Although these articles and materials are available via the World Wide Web, standard laws of copyright still exist. Instructors should use all materials in accordance with Fair Use Guidelines. (See cautions noted in the "Instructional Aids" section of this curriculum guide.)

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 1

HOURS: 1

TITLE: Rules of the Road/Maneuvering Board Refresher

I. Learning Objectives

- A. The student will show comprehension of the purpose and significance of both the International and Inland Rules of the Road.
- B. The student will review and show terminologies associated with the Rules of the Road.
- C. The Student will review the theory of relative motion.
- D. The student review "bearing drift" and apply the concept in determining relative motion.
- E. The student will review the correct terminology associated with the speed triangle and the relative plot.
- F. The student will review the use of the 3-minute and 6-minute rules.

II. References and Texts

A. Instructor references

- 1. "Rules of the Road" on Coastguard Website at: <http://www.navcen.uscg.gov/mwv/navrules/navrules.htm>.)
- 2. Navigation Rules, COMDTINST M16672.2D
- 3. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 4. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 1-1 through 4-6

B. Student texts

- 1. Navigation Rules, COMDTINST M16672.2D
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 1-1 through 4-6

III. Instructional Aids

- A. Training Device 6605-00-240-05717: Wall-mounted maneuvering board
- B. Large parallel rulers (chalkboard)
- C. Large dividers 18" (chalkboard)
- D. PowerPoint slide or transparency of maneuvering board
- E. Computer/projection system or overhead projector
- F. Chalkboard/whiteboard
- G. Video: Relative Motion and the Maneuvering Board, 24177DN, 12 min. (optional) (NOTE: Copies of this video are no longer available; however, if a unit still has a copy, it would fit in well with this lesson.)
- H. VCR/Monitor (optional)

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Lecture/Demonstration
 - 2. The optional video may be used to illustrate the concept of relative motion. Preview the video prior to classroom use.
- B. Procedural and student activity option:
 - 1. Review the importance of the Rules of the Road and discuss importance to the fleet.
 - 2. Work maneuvering board problems presented in the maneuvering board workbook and re-emphasize the following points during the lecture:
 - a. Only true vectors originate from the center of the maneuvering board. These true vectors represent the true course and speed of the reference and maneuvering ship.
 - b. All vectors should be labeled properly.
 - c. Work a problem one step at a time. An entire problem may seem complicated, but each step is simple, and the solution to the problem, as a whole, often depends on the ability to solve each separate step.

- d. Explain that the 5:1 scale is normally used for the speed triangle in the fleet.
- e. Demonstrate the use of the various speed/distance scales and the need to record the scale that is selected.
- f. Demonstrate the use of the time/speed/distance nomogram.

B. Presentation

1. Rules of the Road

- a. Review purpose and scope of Rules of the Road.
- b. Review ROR lights and day shapes.
- c. Review steering and sailing rules.

2. Maneuvering Board Refresher

- a. Review definition of relative motion.
- b. Review true and relative bearings.
- c. Review the maneuvering board and how to plot on it.
- d. Review "closest point of approach" (CPA) and bearing, range, and time. Have students work problems from the Maneuvering Board Workbook.
- e. Review the speed triangle.
- f. Assign problems from Maneuvering Board Workbook to ensure student has comprehension of MO board technique.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 2

HOURS: 1

TITLE: Tracking & Interception

I. Learning Objectives

- A. The student will apply the concepts of relative motion and the speed triangle to determine interception course, speeds, and times.
- B. The student will understand a tracking-intercept problem is simply a combination of two maneuvering board problems.

II. References and Texts

A. Instructor references

- 1. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 12-1 through 13-7

B. Student texts

- 1. Radar Navigation and Maneuvering Board Manual, PUB 1310 (Instructor Handouts)
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 12-1 through 13-7

III. Instructional Aids

- A. Training Device 6605-00-240-5717: Wall-mounted maneuvering board
- B. Large parallel rulers (chalkboard)
- C. Large dividers 18" (chalkboard)
- D. PowerPoint slide or transparency of maneuvering board
- E. Computer/projection system or overhead projector
- F. Chalkboard/whiteboard

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Lecture
 - 2. Problem-solving demonstration
 - B. Procedural and student activity options
 - 1. Work practical tracking and intercept problems in class.
 - 2. Assign homework.
- V. Presentation
- A. Define the following:
 - 1. Tracking
 - 2. Interception
 - B. Demonstrate solving tracking/interception problems. Illustrate the combination of the two maneuvering board problems. (Hint: Use of colored pencils for two maneuvering board problems often helps students differentiate between the problems and should make visualization easier.)
 - 1. Initial tracking of a ship
 - 2. Intercept of contact
 - C. Ensure students understand the ability to distinguish between the maneuvering ship and reference ship.
 - D. One of the most difficult concepts for students to grasp is that of intentionally driving at a ship. To help explain, use examples including UNREP, Search and Assist, and maritime boardings to help them understand why this practice may be necessary.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LABORATORY: 1

HOURS: 1

TITLE: Maneuvering Board Fundamentals/Tracking and Intercepts

I. Learning Objectives

- A. The student will apply the relative plot and the speed triangle to determine the closest point of approach (CPA), the time of CPA, and the true course and speed of the maneuvering ship using the maneuvering board.
- B. The student will understand a tracking-intercept problem is simply a combination of two maneuvering board problems.

II. References and Texts

A. Instructor references

- 1. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 12-1 through 13-7

B. Student texts

- 1. Radar Navigation and Maneuvering Board Manual, PUB 1310 (Instructor Handouts)
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 12-1 through 13-7

III. Instructional Aids

- A. Training Device 6605-00-240-5717: Wall-mounted maneuvering board
- B. Large parallel rulers (chalkboard)
- C. Large dividers 18" (chalkboard)
- D. PowerPoint slide or transparency of maneuvering board sheet
- E. Computer/projection system or overhead projector
- F. Chalkboard/whiteboard

IV. Suggested Methods and Procedures

- A. Problems 5.1 through 5.8 are basic tracking problems.
- B. Problems 5.9, 5.11, and 5.13 cover passing ahead or astern, along with finding the CPA.
- C. Problems 5.12 through 5.14 introduce the additional work required if either reference or maneuvering ship alters course or speed.
- D. Problems 6.1 through 6.3 are basic required course and speed problems.
- E. Problems 6.4 through 6.9 are higher level stationing problems; good for discussion.
- F. Problem 6.10 is an ideal review problem.
- G. All problems in Chapter 7 reinforce the relationship between relative motion and the speed triangle. These are advanced stationing problems.
- H. All problems in Chapter 8 reinforce the relationship between relative motion and the speed triangle by requiring students to solve for multiple stations.
- I. All problems in Chapter 12 and 13 provide practice in maneuvering for intercepts.
- J. The following problems are recommended for homework and discussion during lab: 5.3, 5.5, 5.8, 5.9, 5.10, 5.13, 6.2, 6.4, 6.12, 7.3, 7.7, 8.8 and Chapters 12 and 13.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 3

HOURS: 1

**TITLE: International COLREGS/U.S. Inland Rules: Differences/
Special Circumstances and Review**

I. Learning Objectives

- A. The student will know the main points of difference between the International Collision Regulations and the U.S. Inland Rules.
- B. The student will comprehend the situations that are governed by the rule of special circumstances.
- C. The student will know the requirements associated with the Bridge-to-Bridge Radiotelephone Act.

II. References and Texts

- A. Instructor references
 - 1. Navigation Rules, COMDTINST M16672.2D
 - 2. Farwell's Rules of the Nautical Road
- B. Student text: Navigation Rules, COMDTINST M16672.2D, Rules 1-38 and Appendices, Bridge-to-Bridge Radiotelephone Regulations

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Computer/projection system and PowerPoint slides or overhead projector and locally-prepared transparencies

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Lecture/Discussion
 - 2. Emphasis should be placed on the different meaning associated with signals given by the stand-on and give-way vessels in various approach situations.
- B. Procedural and student activity options: Complete assigned reading.

V. Presentation

A. Responsibilities and right of way under Inland Rules

1. Explain that the primary difference between International and Inland Rules is the meaning of whistle signals.
2. Review the duties of stand-on and give-way vessels.
3. Explain that the only difference in the right of way between different categories of vessels is that a "vessel constrained by her draft" is not defined in Inland Rules.

B. Approach situations under Inland Rules

1. Review the definition of risk of collision.
2. Discuss the three approach situations and the meaning of the following associated whistle signals:
 - a. Meeting (Rule 9)
 - b. Overtaking (Rule 13)
 - c. Crossing (Rule 15)
3. Explain how to resolve ambiguous situations (i.e., meeting or crossing; crossing or overtaking).

C. Discuss approach evaluations as viewed on radar.
(**NOTE:** Review conduct of vessels in reduced visibility.)

D. Review light and day shape differences between Inland and International Rules, including:

1. Differences in location and length requirements
2. Towing light difference (Rule 24 - Inland Rules)
 - a. Towing astern
 - b. Pushing ahead or towing alongside

E. Discuss special circumstances not specifically addressed by the rules.

1. Situations where the vessels find themselves already in "extremis." (**NOTE:** "Extremis" is used in the text; however, it is no longer a recognized legal term. The court has determined that vessels should take due action to avoid situations deemed to be "in extremis.")
 2. Situations where a vessel is unable to comply with the rules through some uncontrollable circumstance.
 3. Presence of more than two vessels approaching simultaneously.
 4. Approach situations where the vessels have agreed to depart from the rules.
- F. Discuss the use of the bridge-to-bridge radiotelephone and the log-keeping requirements as presented in the Bridge-to-Bridge Radiotelephone Act (pp. 206-210 of Navigation Rules).
- G. Simulate a typical bridge-to-bridge radiotelephone transmission between a U.S. naval vessel and a merchant ship under the following circumstances:
1. Meeting
 2. Crossing
 3. Overtaking

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 4

HOURS: 2

TITLE: International Law/Federal Regulations and Naval Operations

I. Learning Objectives

- A. The student will be able to define the concept of maritime baselines.
- B. The student will be able to define "national waters," "international waters," "continental shelves," and "safety zones."
- C. The student will know the difference between "national airspace," "international airspace," and "outerspace."
- D. The student will know the international law status of military aircraft and ships of war.
- E. The student will comprehend the provisions of international law regarding navigation in and overflight of national and international waters.
- F. The student will be familiar with the main provisions of laws and regulations governing environmental pollution by ships.
- G. The student will be familiar with the U.S. Navy/Russian Federation Navy agreements to prevent incidents at sea while conducting naval exercises (INCSEA Agreement).

II. References and Texts

- A. Instructor references
 - 1. International Law for Seagoing Officers, Chapters 4 through 7
 - 2. U.S. Navy Regulations, Paragraphs 0925 and 1121
(Available at: <http://neds.daps.dla.mil/regs.htm>.)
- B. Student texts: None

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Computer/projection system and PowerPoint slides or overhead projector and locally-prepared transparencies

IV. Suggested Methods and Procedures

A. Method options

1. Lecture
2. Guest lecturer from the university law school or from a Navy JAG reserve unit.

B. Procedural and student activity options: Lecture/discussion.

V. Presentation

A. Discuss the international law definitions and usages relating to territorial seas and the high seas.

1. For students to understand the difference between territorial seas and international waters, the "baseline" must be defined as a reference for measurement, including a discussion of:
 - a. Low water line
 - b. Straight baselines
 - c. Bays and gulfs
 - d. River mouths
 - e. Reefs
 - f. Harbor works
2. Define the term "national waters" and discuss the legal limits and privileges of national jurisdiction in national waters, including:
 - a. Internal waters
 - b. Territorial seas
 - c. Archipelagic waters
3. Define "international waters" and discuss the legal jurisdictions of littoral states over international waters, including:
 - a. Contiguous zones
 - b. Exclusive economic zones

- c. High seas
 - d. Security zones
 - e. Continental shelf
 - f. Safety zones
 - g. Littoral distance
- 4. Define and differentiate between international airspace, national airspace, and outerspace in terms of jurisdiction.
- B. Discuss the status of ships and aircraft and passage rights under international law.
 - 1. Define and discuss the status under international law of each of the following:
 - a. Warship
 - b. Naval auxiliary
 - c. Merchant vessel
 - d. Military aircraft
 - e. Military contract aircraft
 - f. Civilian aircraft
 - 2. Discuss the customary international law regarding navigation within the national waters of another nation and overflights of the national airspace of another nation by:
 - a. Warships or naval auxiliaries
 - b. Merchant vessels
 - c. Military aircraft and military contract aircraft
 - d. Civil aircraft
 - 3. Define and discuss transit passage rights in international straits, including:
 - a. Straits solely in the territorial waters of coastal nations

- b. Straits not completely overlapped by territorial seas
 - 4. Define and discuss transit passage rights of military ships and aircraft in archipelagic waters, including:
 - a. Archipelagic sea lanes passages
 - b. Passages within other archipelagic waters
 - 5. Discuss the status of navigation and over-flight of international waters, including:
 - a. Contiguous zone
 - b. Exclusive economic zones
 - c. The high seas
 - d. Closure or warning areas
 - e. Declared security or defense zones
 - f. Air defense identification zones
 - 6. Discuss the United States' practice regarding navigation or operation of military aircraft relative to:
 - a. The polar regions
 - b. Nuclear-free zones
 - c. Convention on International Civil Aviation
- C. Define the purpose and discuss the provisions of the U.S. Navy/Russian Federation Navy agreement on the prevention of incidents on or over the high seas.
 - 1. Ships will observe both the letter and spirit of the international rules of the road.
 - 2. Surveillance ships will exercise good seamanship so as not to embarrass or endanger ships under surveillance.
 - 3. Ships will utilize special signals for announcing their operational intentions.
 - 4. Ships of one party will not simulate attacks,

- launch objects in the direction of, or illuminate the navigation bridges of ships of another party.
5. Ships conducting exercises with submarines shall show appropriate signals to warn of submarines in the area.
 6. When approaching ships of the other party, especially when they are engaged in replenishment or flight operations, approach ships should remain well clear.
 7. Aircraft will use caution when approaching aircraft or ships of the other party.
- D. Discuss the duties and responsibilities of Navy ships with respect to rescue at sea. "The Bolinao Affair" Case Study (Appendix A) can be used to illustrate the consequences of failure to provide adequate assistance to vessels and persons in distress on the high seas.
- E. Discuss the application of environmental pollution laws in the operation of naval ships, including:
1. Minimum distance from shore requirements for disposal of certain waste items.
 - a. Trash - 50 miles
 - b. Garbage - 12 miles
 - c. Sewage - 3 miles
 - d. Petroleum products or petroleum-contaminated water - 50 miles
 2. Reporting requirements for petroleum spills.
 3. The ban on dumping plastics at sea in accordance with the 1993 International Convention for Prevention of Pollution from Ships.
 4. The total ban on disposal of medical waste at sea.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 5

HOURS: 1

TITLE: Voyage Planning and Time

I. Learning Objectives

- A. The student will apply correct procedures to determine zone time for specific locations.
- B. The student will apply correct procedures to determine zone time at another location, if zone time is known at a given location.
- C. The student will apply correct procedures to convert longitude or arc units into equivalent time units.
- D. The student will comprehend the process of planning for an extended ocean voyage and the services and publications that can be of assistance during voyage planning.
- E. The student will comprehend the procedures for plotting a great circle route on a gnomonic projection, transferring the track to a mercator projection, and labeling the track appropriately.

II. References and Texts

A. Instructor references

- 1. Marine Navigation, Chapter 15
- 2. Dutton's Nautical Navigation, Chapters 9 and 23
- 3. American Practical Navigator, Chapters 18 and 25
- 4. COMNAVSURFLANT/COMNAVSURPAC/COMNAVAIRPAC/
COMNAVAIRLANT Instruction 3530.4, Subj:
"Navigation Standards and Procedures"
- 5. Marine Navigation Workbook

B. Student texts

- 1. Marine Navigation, Chapter 15
- 2. Marine Navigation Workbook

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Great Circle Sailing Chart: North Atlantic (number 17)
- C. North Atlantic Ocean Chart (number 120)
- D. Time zone chart of the world (number 76)
- E. Plotting instruments
- F. Slide/transparency of Arc/Time Conversion Table from Nautical Almanac
- G. Computer/projection system and PowerPoint slides or overhead projector and locally-prepared transparencies

IV. Suggested Methods and Procedures

- A. Method options: Lecture/Demonstration
- B. Procedural and student activity options
 - 1. Complete assigned reading
 - 2. Complete assigned workbook exercises

V. Presentation

- A. Develop the concept of time zones.
 - 1. Define and discuss:
 - a. Zone time
 - b. Greenwich Mean Time
 - c. Zone description
 - d. International Date Line
 - 2. Explain the correlation between zone time indicators and zone descriptions.
 - 3. Demonstrate, through the use of examples, how to perform time conversion from zone time at one location to zone time at a second location, including daylight savings time considerations.
 - 4. Explain how clocks are advanced and retarded.

- a. Advanced during the mid-watch (0000-0400)
 - b. Retarded during the second dog watch (1800-2000)
- B. Review date-time group (DTG) format.
- C. Arc/Time conversion
 - 1. Explain and discuss.
 - 2. Work practical examples of conversion (arc to time and vice versa).
- D. Discuss the general preparation involved in planning a ship's movement. COMNAVSURFLANT/COMNAVSURFPAC/COMNAVAIRLANT/COMNAVAIRPAC Instruction 3530.4, Subj: "Navigation Standards and Procedures," provides a good format for presentation.
- E. Review the use of publications and charts in voyage planning.
- F. Explain the planning involved in plotting the intended track.
 - 1. Discuss the use of Optimum Track Ship Routing (OTSR) and the chart and fix expansion factors that should be included in filing a request for OTSR.
 - 2. Discuss the use of MOVREPS in conjunction with an OTSR.
 - 3. Demonstrate plotting a great circle route on a gnomonic projection.
 - 4. Transfer the track to a mercator projection chart and label it.
 - 5. Discuss course and speed considerations.
 - a. Explain the need to consider and avoid hazards to navigation using aids to navigation and through the plotting of danger bearings.
 - b. Discuss the need to consider fuel economy.
 - c. Explain the determination of ETD and ETA.
 - d. Discuss the concepts of position of intended movement (PIM).

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 6

HOURS: 1

TITLE: Formations, Dispositions, Screens, and Maneuvering Rules

I. Learning Objectives

- A. The student will know terminology associated with formation steaming operations.
- B. The student will comprehend the principle rules for formation maneuvering.
- C. The student will comprehend usage of the signal book to obtain the meaning of tactical signals.
- D. The student will apply the rules for maneuvering in solving maneuvering board problems in response to tactical signals.

II. References and Texts

A. Instructor references

- 1. Surface Ship Operations, NAVEDTRA 12973, pp. 6-1 through 6-15
- 2. NROTC Exercise Signal Book, NAVEDTRA 37310
- 3. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 4. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 9-1 through 10-13, 18.

B. Student texts

- 1. Surface Ship Operations, NAVEDTRA 12973, pp. 6-1 through 6-15
- 2. NROTC Exercise Signal Book, NAVEDTRA 37310
- 3. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 4. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 9-1 through 10-13, 18.

C. Instructional Aids

1. Training Device 6605-00-240-5717: Wall-mounted maneuvering board
2. Large parallel rulers (chalkboard)
3. Large dividers 18" (chalkboard)
4. PowerPoint slide or transparency of maneuvering board
5. Computer/projection system or overhead projector
6. Chalkboard/whiteboard

III. Suggested Methods and Procedures

- A. Method options
 1. Lecture
 2. Problem-solving demonstration
- B. Procedural and student activity options: Students should work the problems in class, along with the instructor.

IV. Presentation

- A. Define the following in relation to formation steaming and maneuvering:
 1. "Large ship" and "small ship"
 2. Maneuver
 3. Formation
 4. Disposition
 5. Main body
 6. Screen
 7. Guide
 8. Line guide
 9. Station
 10. Base course
 11. Speed, including:

- a. Base speed
 - b. Stationing speed
 - c. Maximum speed available
- 12. Standard distance
- 13. Maneuvering interval
- 14. Tactical diameter
 - a. Standard tactical diameter
 - b. Reduced tactical diameter
- B. Column and line formations
 - 1. Discuss the features of the following single-column formations -- include organizational geometry and placement of the guide.
 - a. Column
 - b. Loose line of column
 - c. Column open order
 - 2. Discuss the uses of line formations, organizational geometry, and placement of the guide in the following line formations:
 - a. Line abreast
 - b. Loose line abreast
 - c. Line of bearing
 - d. Diamond
- C. Discuss the rules for forming the various column and line formations to include:
 - 1. Forming as directed by OTC
 - 2. Forming in quickest sequence
 - 3. Forming in order of sequence numbers
- D. Rules for maneuvering while in formations

1. Maneuvers initiated by a "Turn" signal
 - a. All ships turn simultaneously. (Hint: This is similar to a "flank" drill maneuver.)
 - b. True bearing to the guide remains unchanged; relative bearing changes.
 - c. Ships should match guide ship's turning circle.
2. Maneuvers initiated by "Corpen" signal
 - a. "Corpen" wheels the formation. The formation course is altered, but the arrangement of ships does not change. (Hint: This is similar to a "column" drill maneuver.)
 - b. Relative bearing to/from the guide is maintained, but true bearing changes.
 - c. Discuss the maneuvering rules associated with "Corpens."
 - (1) Which formations may execute "Corpens"?
 - (2) Limitations on the amount the formation course may be altered.
3. Maneuvers initiated by "Formation" signal
 - a. Used to change arrangement of ships -- no change of course or speed.
 - b. The guide maintains course and speed; other ships reform on the guide.
4. Search turns
 - a. Maintains search area integrity
 - b. Ships must be in a line abreast (or loose line abreast) at least 1,000 yards (or 1,500 yards) apart.
 - c. Discuss and illustrate search turn procedures and minimum and maximum (45 to 135 degrees) limitations to amount of course alteration.
- E. Discuss the situations where there are automatic shifts of the guide ship.

- F. Discuss the concept of circular formations.
 - 1. Stationing - assigned station = distance from center in 1000s of yards; last 3 digits are position relative to axis of formation.
 - 2. Maneuvering
 - 3. Axis rotation
- G. Discuss sector screens.
 - 1. Purpose of sector screens
 - a. Units assigned an area of responsibility in which to conduct random patrols for protection of the main body.
 - b. Serves to hide base course and speed of formation.
 - 2. Sector screen station assignment
 - a. Explain the four number sector boundary assignment, followed by the four number sector depth assignment.
 - b. Explain the meaning of a tactical signal assigning a sector screen station. For example: 0106 - 0409 DESIG (ship's call sign).
 - c. Explain the rules for patrolling within the sector.
- H. Discuss the special maneuvering rules governing ships in a formation. (Review of Navigation and Rules of the Road.)
 - 1. Vessels shall keep out of the way of other vessels that are restricted in their ability to maneuver in accordance with the following list, which is ordered from most restricted to least restricted in maneuvering ability.
 - a. Vessel engaged in the sweeping of mines
 - b. Vessels engaged in underway replenishment
 - c. Vessels engaged in flight operations
 - d. Main body ships

- e. Screen ships
2. In addition, the following rules apply:
- a. Helicopters engaged in "dipping" sonar should be avoided by at least 500 yards.
 - b. Ships not on station should keep clear of ships on station.
 - c. Do not pass through formations without permission of the OTC.
 - d. Seniors may request juniors who have the "right of way" to keep clear if the senior makes the request well in advance and both agree to a deviation from the Rules of the Road or standard Navy practice.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LABORATORY: 2

HOURS: 1

TITLE: Formations and Maneuvering Rules

I. Learning Objectives

- A. The student will know terminology associated with formation steaming operations.
- B. The student will comprehend the principle rules for formation maneuvering.
- C. The student will comprehend usage of the signal book to obtain the meaning of tactical signals.
- D. The student will apply the rules for maneuvering in solving maneuvering board problems in response to tactical signals.

II. References and Texts

A. Instructor references

- 1. Surface Ship Operations, NAVEDTRA 12973, pp. 6-1 through 6-15
- 2. NROTC Exercise Signal Book, NAVEDTRA 37310
- 3. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 4. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 9-1 through 10-13, 18.

B. Student texts

- 1. Surface Ship Operations, NAVEDTRA 12973, pp. 6-1 through 6-15
- 2. NROTC Exercise Signal Book, NAVEDTRA 37310
- 3. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 4. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 9-1 through 10-13, 18.

III. Instructional Aids

- A. Training Device 6605-00-240-5717: Wall-mounted maneuvering board
- B. Large parallel rulers (chalkboard)
- C. Large dividers 18" (chalkboard)
- D. PowerPoint slide or transparency of maneuvering board
- E. Computer/projection system or overhead projector
- F. Chalkboard/whiteboard

IV. Suggested Methods and Procedures

- A. All problems from Chapters 9, 10, and 18 represent effective formation steaming.
- B. Problems 9.6 through 9.11 are especially applicable to testing the students' grasp of previous lessons.
- C. Problems in Chapter 10 need to be discussed carefully; formation axis changes frequently confuse students.
- D. Recommend problems 10.8 through 10.10.
- E. Recommend 10.11 as a two-person problem.
- F. Recommend review of all problems in Chapter 18.
- G. Additional practice: Provide students with a base course and speed of guide and ownship position relative to guide. Have students determine true and relative bearing to guide following various formations and maneuvers (i.e., turn, corpen, diamond, etc.).

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 7

HOURS: 1

TITLE: Operational Security

I. Learning Objectives

- A. The student will comprehend the requirement for operations security (OPSEC) for military forces, including the following elements:
 - 1. The student will:
 - a. Comprehend the advantages of secrecy and harm likely from a lack of secrecy in military mission accomplishment and capabilities; and
 - b. Know the role of secrecy in the initiative, attaining surprise, achieving superiority, and maintaining security against hostile action.
 - 2. The student will comprehend the OPSEC concept and its relationship to other security programs (i.e., COMSEC).
 - 3. The student will comprehend the need for OPSEC, including recognition of the "OPSEC threat."
 - 4. The student will comprehend the concept of Essential Elements of Friendly Information (EEFI).
 - 5. The student will comprehend the OPSEC process.
- B. The student will know procedures for effecting communications security (COMSEC).
 - 1. The student will know the common causes of security compromise and safeguards to prevent unauthorized disclosure.
 - 2. The student will be able to define the term "Information Assurance" and describe how it is used in the naval service.

II. References and Texts

- A. Instructor references
 - 1. OPNAVINST 3432.1 (series), "Operations

Security" (Available at:
[http://neds.daps.dla.mil/.](http://neds.daps.dla.mil/))

2. OPNAVINST 5239.1B, "Navy Information Assurance (IA) Program" (Available at:
<https://infosec.navy.mil/pub/docs/documents/navyn/opnavinst/5239-1b.doc>.)
3. Navy Information Assurance website at:
https://infosec.navy.mil/ps/?t=main/main.tag&bc=main/bc_main.html.)
4. Joint Publication 3-54, Joint Doctrine for Operations Security (optional) (Available at www.dtic.mil/doctrine/ or on Joint Electronic Library CD-ROM.)

B. Student texts: None

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system
- C. VCR/Monitor (optional)
- D. Video: "Operations Security" (1992), #805459, 10 min. (optional) (NOTE: Copies of this video are no longer available; however, if a unit still has a copy, it would fit in well with this lesson.)

IV. Suggested Methods and Procedures

- A. Lecture and discussion
- B. View slide presentation or video, followed by discussion.

V. Presentation

- A. Application to midshipmen: Since NROTC units do not routinely deal with defense-sensitive information, OPSEC may not be emphasized as much as it would be in the fleet. However, defense-sensitive information does become available to NROTC units, especially relating to midshipmen cruises. Therefore, all NROTC units are required to conduct training (per OPNAVINST 3432) on the Navy's OPSEC program prior to cruise and commissioning.

- B. Discuss the operations security concept.
1. Protection of military operations, activities, and capabilities from hostile exploitation.
 2. Recognition of the requisite degree of security needed.
 - a. Inadequate OPSEC degrades operational effectiveness by hindering the achievement of surprise.
 - b. Excessive OPSEC can degrade operational effectiveness by interfering with required activities, such as coordination, training, and logistic support.
 3. Recognition that absolute security and secrecy is impossible. In addition to excessive OPSEC interference, there is also the matter of responsibility of the Armed Forces to account for their actions to the American people whom they serve. The need to practice OPSEC should not be used as an excuse to deny noncritical information to the public.
 4. The penetration of secrecy and security is done through espionage or the processing and evaluation of accessible sources.
 5. An adversary can "piece together" friendly intentions, capabilities, and activities by gathering elements of friendly information (EEFI).
- C. Discuss the role of secrecy in the initiative, attaining surprise, achieving superiority and maintaining security against hostile action. Outline some examples of secrecy in warfare.
1. Spanish Armada (1588): English able to concentrate limited forces at the proper time because preparations and intentions of the Spanish were known beforehand.
 2. Pearl Harbor (1941): Obvious Japanese signs ignored. Admiral Kimmel and General Short each thought the other was better prepared and did not desire to meddle in the other's affairs; no coordinated defense effort despite advanced indications of an upcoming attack.
 3. Normandy Invasion (1944): Allied deception con-

vinced Germans the main invasion would be at the Pas de Calais and continued to convince Hitler to hold six Panzer divisions in check for six weeks awaiting an invasion by General Patton's army at that site -- major factor in the success at Normandy.

4. September 11th (2001): Extensive debate exists about how much information was available prior to the attacks. An example of how withholding information and maintaining security can work against each other and of how sharing information is sometimes necessary.
- D. The OPSEC process. Unfortunately, wartime lessons are frequently dismissed as being applicable only to the past. These five basic steps of the OPSEC process are essential to the success of the Operations Security Program (as delineated in OPNAVINST 3432):
1. OPSEC Action 1 -- Identification of Critical Information
 2. OPSEC Action 2 -- Analysis of Threats
 3. OPSEC Action 3 -- Analysis of Vulnerability
 4. OPSEC Action 4 -- Assessment of Risk
 5. OPSEC Action 5 -- Application of Appropriate OPSEC Measures
- E. Discuss the hostile intelligence threat and OPSEC measures used to counter the threat. Place emphasis on hostile espionage spotting and assessing techniques, terrorists gathering of targeting intelligence, criminal/saboteur/special purpose forces gathering of intelligence, and OPSEC measures to counter these threats. Discuss recent events concerning terrorism attacks and methods for reducing vulnerability.
- F. Outline the role of OPSEC in Command and Control Warfare (C2W): C2W is the integrated use of OPSEC, military deception (MILDEC), psychological operations (PSYOP), electronic warfare (EW), and physical destruction -- all mutually supported by intelligence -- to deny information to, influence, degrade, or destroy adversary C2 capabilities while protecting friendly C2 capabilities against such actions.
- G. Introduce the term "Information Assurance (IA)". (Refer to OPNAVINST 5239.1B for details.)

1. IA is defined as information operations that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities.
2. IA objectives are:
 - a. Protect information and resources to the degree commensurate with their value.
 - b. Employ efficient procedures and cost-effective, information-based security features on all information technology resources procured, developed, operated, maintained, or managed by Navy organizational elements to protect the information on those resources. An analysis of costs and benefits should be used determine which procedures and security features are appropriate, including a realistic assessment of the remaining useful life of legacy systems compared with the cost of adding new security safeguards.
 - c. Adopt a risk-based life cycle management approach in applying uniform standards for the protection of Navy information technology resources that produce, process, store, or transmit information.
 - d. Conduct an assessment of threats, identify the appropriate combination of safeguards from the IA disciplines, and apply an appropriate level of certification and accreditation for each specific information system developed by a program office and for each site employing networks and deployed information systems.
- H. Introduce the terms Communications Security (COMSEC) and Communications Security Material System (CMS) and their relationships to OPSEC. Give examples of secure communications (e.g., STU-III, satellite, line of sight communications, etc.).

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 8

HOURS: 1

TITLE: Visual Communications/Signal Book

I. Learning Objectives

- A. The student will know signal flags and pennants and comprehend the purpose and scope of flags and pennants, flashing lights, and semaphore when used in communications.
- B. The student will know the use of international Morse Code and code groups, including SOS, AA, and AS.
- C. The student will know the procedures for use of international and Navy flags for visual signaling.
- D. The student will comprehend and apply the exercise signal book's contents for encoding and decoding signals.

II. References and Texts

A. Instructor references

- 1. Surface Ship Operations, NAVEDTRA 12973, pp. 5-21 through 5-30
- 2. NROTC Exercise Signal Book, NAVEDTRA 37310
- 3. "Science of Morse Code" (Available at <http://collections.ic.gc.ca/cable/scimorse.htm>.)
- 4. "U.S. Navy Signal Flags" (Available at: <http://www.chinfo.navy.mil/navpalib/communications/flags/flags.html>.)
- 5. An online flag simulator is available at: <http://www.eskimo.com/cgi-bin/flags>.

B. Student texts

- 1. Surface Ship Operations, NAVEDTRA 12973, pp. 5-21 through 5-30
- 2. NROTC Exercise Signal Book, NAVEDTRA 37310

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Flaghoist trainer (optional)
- C. Flag Card Sets or Flag Handout (attached)
- D. Morse Code Handout (attached)

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Ensure students are familiar with the general layout of the signal book. Concentrate on explaining general instructions and encoding/decoding procedures.
 - 2. The primary purpose of this lesson is for the student to understand the mechanics of flaghoist signals from the standpoint of an OOD. This includes concepts of relaying, execution of signal, arrangement of signal, and procedures outlined in the general instructions. Instructors should explain that the Exercise Signal Book does not contain the same letter signals as the classified signal book used in the fleet; however, the method of use is the same as in the actual signal book.
 - 3. Distribute a handout that lists the Morse Code symbols for the letters and numbers (attached).
- B. Procedural and student activity options: Work assignment.

V. Presentation

- A. Provide students with the correct meanings for flags. NOTE: The flag meanings presented in the Signal Book are not the Naval meanings. The correct Naval meanings (attached) are unclassified and are available at several websites, including the following:
 - 1. "U.S. Navy Signal Flags" (Available at: <http://www.chinfo.navy.mil/navpalib/communications/flags/flags.html>.)
 - 2. An online flag simulator is available at: <http://www.eskimo.com/cgi-bin/flags>.
- B. Cover the following flaghoist procedures and provide examples as appropriate:

1. Order of reading hoists -- outboard to inboard, top to bottom.
 2. Explanation of terms, including "at the dip," "closed up," and "hauled down." Differentiate between the meanings depending on whether displayed aboard the sending and receiving ships.
 3. Message relaying.
 4. Methods of execution.
 5. Flag identification. To assist students with this, distribute flag flash cards or the flag handout (attached).
 6. Flag meanings (e.g., Alfa = divers in the water).
- C. Briefly discuss semaphore and flashing light.
- D. Discuss the tactical advantages and disadvantages of visual communications.
- E. Conduct a detailed discussion of Chapter 1 of the Exercise Signal Book to include:
1. Encoding/decoding messages.
 2. Signal construction.
 3. Supplementary signal methods.
 4. Governing penants/groups.
 5. Tables.
 6. Signaling time.
 7. Basic Maneuvering signals.
- F. Briefly review Morse Code methods and code groups. A Morse Code alphabet listing is attached and is also available at:
<http://collections.ic.gc.ca/cable/scimorse.htm>.

Naval Operations and Seamanship

International Morse Code

Phonetic	Letter	Code
Alpha	A	. -
Bravo	B	- ...
Charlie	C	- . -
Delta	D	- ..
Echo	E	.
Foxtrot	F	.. -
Golf	G	-- .
Hotel	H
India	I	..
Juliett	J	. ---
Kilo	K	- . -
Lima	L	. - ..
Mike	M	--
November	N	- .
Oscar	O	---
Papa	P	. - -
Quebec	Q	-- . -
Romeo	R	. - .
Sierra	S	...
Tango	T	- .
Uniform	U	.. -
Victor	V	... -
Whiskey	W	. - -
X-ray	X	- .. -
Yankee	Y	- . - -
Zulu	Z	-- ..

Phonetic	Character	Code
Zero	0	-----
Wun	1	. -----
Two	2	.. ----
Tree	3	... ---
Four	4 -
Fife	5
Six	6	-
Seven	7	-- ...
Eight	8	--- ..
Niner	9	---- .

Punctuation Marks	Code
Full Stop (period)	. - . -
Comma	- . - -
Colon	--- ..
Question Mark (query)	. - . .
Apostrophe	. - - .
Hyphen	- . - -
Fraction Bar	- . - .
Brackets (parentheses)	- . - . -
Quotation Marks	. - . -

Other Messages	Code
Double Dash (BT)	- ... -
End of Message (AR)	. - .
End of Contact (AK)	... -



























If the duration of a dot is taken to be one unit, then that of a dash is three units.








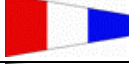



























One dot = 1 sec

One dash = 3-6 sec

The space between the components of one character is one unit, between characters is three units, and between words, seven units.

To indicate that a mistake has been made and for the receiver to delete the last word, send (eight dots).

Flag	Letter	Meaning
	A Alfa	Diver down, keep clear
	B Bravo	Taking in/discharging dangerous cargo
	C Charlie	Yes or affirmative
	D Delta	I am maneuvering with difficulty; keep clear
	E Echo	I am directing course to starboard
	F Foxtrot	I am disabled CV/CVN: Flight Ops
	G Golf	I require a pilot
	H Hotel	Pilot Onboard Helo Ops (1-Vertrep)
	I India	Coming Alongside Intl: Course to Port
	J Juliett	On fire w/dangerous cargo, keep clear
	K Kilo	I wish to communicate 1-Aloft, 3-Over side
	L Lima	Stop immediately HERO
	M Mike	My vessel is stopped, also, Dr. onboard
	N November	No or negative
	O Oscar	Man Overboard
	P Papa	All personnel return to ship; going to sea
	Q Quebec	Boat recall – all boats return to ship
	R Romeo	Preparing to replenish
	S Sierra	Conducting flag hoist drill
	T Tango	Do not pass ahead Intl: trawling in prog.
	U Uniform	You are running into danger; anchored
	V Victor	I require assistance
	W Whiskey	I require medical assistance
	X X-ray	Stop what you are doing, watch my sigs
	Y Yankee	Ship has visual comms duty
	Z Zulu	I require a tug

Flag	Pennant	Character	Meaning
		0 (or p0) Zero	None
		1 (or p1) One	None
		2 (or p2) Two	None
		3 (or p3) Tree	None
		4 (or p4) Four	None
		5 (or p5) Fife	Flag: Breakdown
		6 (or p6) Six	None
		7 (or p7) Seven	None
		8 (or p8) Eight	None
		9 (or p9) Niner	None
Pennant or Flag		Spoken	Meaning
		1 st Sub	Flag is absent Sub for 1 st in FH
		2 nd Sub	COS is absent Sub for 2 nd in FH
		3 rd Sub	CO is absent Sub for 3 rd in FH
		4 th Sub	Civ is absent Sub for 4 th in FH
		Code or Answer	Msg follows Msg understood
		Interrogative INT	Question follows
		Negative NEGAT	No or Negative
		Preparatory PREP	Prepare or Preparing
		Starboard	Starboard
		Port	Port
		Emergency	Emergency
		Corpen	Course Change Execute Corpen
		Turn	Execute Turn
		Speed	Speed order
		Screen	Screen order

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 9

HOURS: 1.5

TITLE: External Communications/Radiotelephone (R/T)

I. Learning Objectives

- A. The student will comprehend the purpose and scope of electrical communication systems, including fleet broadcast, tactical radio, and ship to shore components.
- B. The student will know proper R/T procedures.
- C. The student will comprehend frequency spectrum selection in Navy communications.

II. References and texts

- A. Instructor reference: Surface Ship Operations, NAVEDTRA 12973, pp. 5-1 through 5-20
- B. Student text: Surface Ship Operations, NAVEDTRA 12973, pp. 5-1 through 5-20

III. Instructional Aid: Chalkboard/Whiteboard

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Lecture
 - 2. Use your school's language lab to give students a feel for talking on the R/T. Laboratory 3 (attached) is a sample drill that can be used as a nucleus for an hour-long R/T exercise. The proper answers should not be provided to the students beforehand, so they can learn from the preparation as well. (If a lab is unavailable, students can sit in different classrooms and talk to each other via hand-held radios or walkie-talkies.)
 - 3. Provide a handout on the phonetic alphabet to all students.
- B. Procedural and student activity options
 - 1. The instructor should assign the reading assignment prior to class.

2. Every student should participate in an R/T exercise.

V. Presentation

- A. Discuss the frequency spectrum and uses of each frequency range in radio communications. Include the following frequencies:

1. HF
2. VHF
3. UHF
4. SHF
5. EHF

- B. Discuss the following prowords used in R/T:

1. Break = BT
2. Call sign = C/S
3. Over = K
4. Out = AR
5. Roger = R
6. Will Comply = WILCO
7. Wait = AS
8. This is = DE
9. Execute = XT
10. Execute to follow = XTF
11. Immediate execute = IX
12. I say again = IMI
13. Interrogative = INT

INSTRUCTOR NOTE: Surface Ship Operations' prowords for Execute, Execute to Follow, and Immediate Execute are incorrect. The correct prowords are listed above. These terms are unclassified and should be taught to students.

- C. Discuss the degrees of radio coverage, when and how used, and receiving ship's responsibility (guard, cover, copy, listen).
- D. The fleet broadcast method should be discussed from the standpoint of the receiving ship.
- E. Tactical radio
 - 1. Discuss the R/T procedures in general, including the proper R/T techniques.
 - 2. Discuss secure voice (crypto).
 - 3. Have the students develop dummy messages demonstrating correct procedures.
 - 4. Have the students practice logging messages in a dummy tactical signal log.
- F. Operational security (OPSEC): Discuss methods of control of information to preserve requisite security.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LABORATORY: 3

HOURS: 1

TITLE: RADIOTELEPHONE EXERCISES

The following is intended as an example. The instructor may expand/contract the drill as time allows. In addition, three exercises and instructor keys are provided:

1. Radiotelephone Exercise 1 is designed as a useful practice tool. Students should be able to complete this exercise during a course period or as homework.
2. Radiotelephone Exercise 2 is a good practical exercise for communication. Recommend having students use hand-held radios or communicate via telephone to gain an understanding of communication difficulties at sea.
3. Radiotelephone Exercise 3 provides a large group communication exercise and may also be used for possible maneuvering board practice.

Note: *The page numbers listed throughout these exercises correspond to the Exercise Signal Book.*

Call Signs

Station 1 - S9E = USS CARL VINSON

Station 2 - W3R = USS SHOUP

A. S1 call up S2 and conduct a radio check. S2 should reply for:

1. A loud and clear reception, and
2. A fading reception.

ANS: 1. W3R this is S9E, radio check, over
This is W3R, roger, over
This is S9E, roger, out

2. W3R this is S9E, radio check, over
This is W3R, fading, over
This is S9E, roger, out

B. In this example, three types of tactical signals are demonstrated. In the first two, W3R will call up S9E and tell him to execute a turn to PORT 330 using the delayed executive method.

1. The delayed executive method:

S9E this is W3R, execute to follow, break, turn port
330, over
This is S9E, roger, out

S9E this is W3R, standby ... execute, over
This is S9E, roger, out

*(Use this method if the only XTF signal in the air is "Turn
Port 330".)*

S9E this is W3R, execute to follow, break, turn port
330, over
This is S9E, roger, out

S9E this is W3R, turn port 330, standby ... execute,
over
This is S9E, roger, out

*(Use this method if there are several XTF signals in the
air, or if there has been a long delay since the XTF signal
was sent.)*

2. The immediate execute method:

S9E this is W3R, break, immediate execute, turn port
330, I say again, immediate execute, turn port 330,
standby...execute, over

This is S9E, roger, out

C. The following is an example of the non-executive
(information) signal method:

S9E this is W3R, break, TL9 tack 4, break, time 1220Z,
over
This is S9E, roger, out

D. The following is an example of a plain voice message over a
warfare control net:

Victor, this is AW, Warning Red, Weapons Free, break,
take track 8195 with birds, over
This is Victor, roger, birds affirm, out

E. The following example illustrates a message transmitted over
a secure voice net:

VINSON, this is SHOUP, request 5,000 gallons of JP5,
over
This is VINSON, roger, out

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP
LABORATORY 3**

RADIOTELEPHONE EXERCISE 1

Call Signs:

USS John C. Stennis (CVN 74)	N4F
USS Shiloh (CG 67)	F9G
USS Mustin (DDG 89)	L6S

Decode the following signals:

Turn STBD 9

CA1-31-6

CS4-3-B BT CS7-8, K

RN12-4-1430 BT SA13

RY1-DESIG-F9G-5 BT SA17

CG5-245-4 DESIG L6S BT SA5-4

Encode the following:

Support Stennis against torpedo attack. Patrol between positions AA and BB.

Complete Launching Aircraft at 1845.

Commence Launching Aircraft at 1745.

Commence Launching aircraft at 1730 and complete launching aircraft at 1900.

Report when you are ready to investigate the reef.

Commence Scouting a Line of Bearing of 333°T at 0900. Complete the scouting at 1345.

Estimated time of commencement of replenishment is 1300. I supply JP5 in the quantity of 50 U.S. Barrels.

RADIOTELEPHONE EXERCISE 1

The following two conversations could have taken place during recent Navy events. Encode and Decode as required.

Call Signs

USS John C. Stennis (CVN 74)	N4F	USS Shiloh (CG 67)	F9G
USS Mustin (DDG 89)	L6S	USS Asheville (SSN 758)	T8V
COMCARGRU 7	A1B	All Ships in A1B	Z8X

COMCARGRU7 this is MUSTIN. Fire on board. Break. Fire is serious.

L6S DE A1B, INT RY11-2.

COMCARGRU7 this is MUSTIN. This unit has 7 personnel casualties. Break. Send Medical Officer as soon as possible.

L6S DE A1B, SK27-4 BT BA TL12-2-05.

COMCARGRU7 this is MUSTIN. I am adjusting my course to 125deg True, speed 7kts.

STENNIS this is COMCARGRU 7. MUSTIN is sending serious burn casualties to you. Immediate execute Turn to the course required for flight operations.

++++
T8V DE A1B, BL UW61.

COMCARGRU7 this is ASHEVILLE, This ship has been in a collision, I say again, this ship has been in a collision.

L6S DE AIB, CG7-1 BT NEGAT TL41-21 BT TL28-8 T8V

COMCARGRU7 this is ASHEVILLE, Boat on bearing 295 capsized. I recommend proceed to retrieve man overboard. Current is 170T, speed 10kts.

COMCARGRU7 this is MUSTIN, I am ready to assist ASHEVILLE.

L6S DS A1B, CD3-2 BT XTF CS8-1 DESIG T8V

MUSTIN this is COMCARGRU 7, Execute act as radio relay ship.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP
LABORATORY 3**

Radiotelephone Exercise 1

ANSWER KEY

(Page numbers below correspond to the Exercise Signal Book.)

Call Signs:

USS John C. Stennis (CVN 74) N4F
USS Shiloh (CG 67) F9G
USS Mustin (DDG 89) L6S

Decode the following signals:

Turn STBD 9

Turn Starboard 90°

CA1-31-6 -- *Event Engineering Full Power Trial is cancelled.*

CS4-3-B BT CS7-8, K -- *Propagation conditions are below average for 3 to 30 MHz. Use VHF Bridge to Bridge method.*

RN12-4-1430 BT SA13 -- *Estimated time of commencement of flight operations is 1430. Suspend all boating.*

RY1-DESIG-F9G-5 BT SA17 -- *OHP is damaged due to underwater explosion. Send medical officer as soon as possible.*

CG5-245-4 DESIG L6S BT SA5-4 -- *Anchor is on bearing 245T from the USS MUSTIN at 4 nautical miles. Size of colors is to be Sunday/holiday.*

Encode the following:

Support USS John C. Stennis against torpedo attack. Patrol between positions AA&BB.

Page 27-8, 27-9

TL53-2 DESIG N4F BT TL68-AA-BB

Complete Launching Aircraft at 1845. AV-T1845 or SK34-3-T1845
Commence Launching Aircraft at 1745. AV-1845T or SK34-3-1845T
Commence Launching aircraft at 1730 and complete launching aircraft at 1900.

Page 1-7

AV-19T1845 or SK34-3-19T1845

Report when you are ready to investigate the reef.

Page 10-1, Page 27-8

BE TL57-1

Commence Scouting a Line of Bearing of 333°T at 0900. Complete the scouting at 1345.

Page 1-7, Page 27-9

TL69-333-1345T0900

Estimated time of commencement of replenishment is 1300. I supply JP5 in the quantity of 50 U.S. Barrels.

Page 20-3, 28-3

RN12-5-1300 BT UR6-3-28-50C

The following two conversations could have taken place during a recent Navy event. Encode and Decode as required.

Call Signs

USS John C. Stennis (CVN 74)	N4F	USS Shiloh (CG 67)	F9G
USS Mustin (DDG 89)	L6S	USS Asheville (SSN 758)	T8V
COMCARGRU 7	A1B	All Ships in A1B	Z8X

COMCARGRU7 this is USS MUSTIN. Fire on board. Break. Fire is serious.
A1B DE L6S, RY3 BT RY4-2 (Page 22-2)

L6S DE A1B, INT RY11-2. MUSTIN, this is COMCARGRU 7, Do you require Medical assistance? (Page 22-3)

COMCARGRU7 this is USS MUSTIN. This unit has 7 personnel casualties. Break. Send Medical Officer as soon as possible.
A1B DE L6S, RY8-2-7 BT SA17 (Page 22-3, 23-3)

L6S DE A1B, SK27-4 BT BA TL12-2-05.
USS MUSTIN, this is COMCARGRU 7, Helicopter status is airborne. I am maintaining a distance of 5nm. (Page 25-4, 10-1, 27-3)

COMCARGRU7 this is USS MUSTIN. I am adjusting course to 125T, speed 7kts.
A1B DE L6S, H CORPEN 125-7 (Page 7-3)

USS JOHN C. STENNIS this is COMCARGRU 7. USS MUSTIN is sending you serious burn casualties. Immediate execute Turn to course required for flight ops.
N4F DE A1B, SA16-6-2 DESIG L6S BT IX TURN G IMI IX TURN G...STBY...X (Page 23-3, 6-3)

+++++

T8V DE A1B, BL UW61. Asheville this is COMCARGRU7, When ready, surface (Page 10-1, 29-7)

COMCARGRU7 this is USS ASHEVILLE, This ship has been in a collision, I say again, this ship has been in a collision.
A1B DE T8V, RY1-9 IMI RY1-9 or EMERG M IMI EMERG M (Page 22-2 or 3-3)

L6S DE A1B, CG7-1 BT NEGAT TL41-21 BT TL28-8 T8V
USS MUSTIN this is COMCARGRU 7, Channel is obstructed. Do not proceed to port. Stay within visual range of USS ASHEVILLE. (Page 13-2, 27-7, 27-5)

COMCARGRU7 this is USS ASHEVILLE, Boat on bearing 295 capsized. I recommend proceed to retrieve man overboard. Current is 170T, speed 10kts.
A1B DE T8V, SA11-295 BT BC TL41-13 BT RN1-170-10. (Page 23-2, 27-7)

COMCARGRU7 this is USS MUSTIN, I am ready to assist USS ASHEVILLE.
A1B DE L6S, BF SA10 DESIG T8V (Page 10-1, 23-2)

L6S DS A1B, CD3-2 BT XTF CS8-1 DESIG T8V

USS MUSTIN *this is COMCARGRU 7, I am assuming tactical command.*

Execute to follow: Act as radio relay ship for ASHEVILLE.

(Page 12-2, 15-3)

USS MUSTIN *this is COMCARGRU 7, Execute act as radio relay ship.*

L6S DE A1B, CS8-1 X (Page 15-3)

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP
LABORATORY 3**

Radiotelephone Exercise 2

Group 1

You are onboard the USS PORTER (DDG 78). You are operating in company with USS GEORGE WASHINGTON (CVN 73) and USS SUPPLY (AOE-6).

Call signs for today:

WASHINGTON Strike Group	B7G	WASHINGTON	G3W
PORTER	D9H	SUPPLY	S6A

You are on course 230deg True, Speed 18 kts.

You are set for a 1030 rendezvous with the SUPPLY. You will do an alongside underway replenishment, where you will take both DFM and JP-5.

Following this, you will do an emergency breakaway exercise and take station as directed by SUPPLY for a Vertical Replenishment of stores and transfer 6 personnel to SUPPLY. Winds are 170deg True, 13 kts.

Your exercise is to conduct the following communications: Encode the given signals, log and break signals from your partner, and provide any required responses. For some signals, you have the response; for others you will have to write your own. The conversations should be initiated in numerical order. You have some signals; your partner has the others.

For time, log all corresponding signals (initial and response) with question number as minutes (i.e., signal three at time XX03).

3. Request course and speed from USS SUPPLY.
4. Ask SUPPLY to report time to start UNREP.
7. Request SUPPLY's permission to perform Emergency Breakaway exercise.
8. Tell SUPPLY that she will provide the transfer rig.
10. Tell SUPPLY to use flaghoist and that you are ready to come alongside.
12. Request new course and speed.
15. Tell SUPPLY that you are ready to recover her helo and report winds.

17. Report as Emergency that aircraft has been shot down.
18. Correct earlier report: Emergency report that helo is down.
21. WASHINGTON has requested permission to enter port. Tell her channel status.
22. Report number of personnel rescued and their status.
Request any required medical assistance.
24. Inform SUPPLY of unidentified aircraft on bearing 350deg
True, 75nm.
26. Identify the radar contact as an enemy.
28. Tell SUPPLY as you comply with the order in 27.
29. Report status of target.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP
LABORATORY 3**

Radiotelephone Exercise 2

Group 2

You are onboard the USS SUPPLY (AOE-6). You are operating in company with USS GEORGE WASHINGTON (CVN 73) and USS PORTER (DDG 78).

Call signs for today:

WASHINGTON Strike Group	B7G	WASHINGTON	G3W
PORTER	D9H	SUPPLY	S6A

You are on course 180deg True, Speed 20 kts.
You are set for a 1030 rendezvous with the PORTER, for an alongside underway replenishment. You will provide the DFM and JP-5 that are requested. Your underway replenishment course and speed are 200deg True, 13 kts. Following this, you will do an emergency breakaway exercise. You will then take direct the PORTER to take station 90deg relative, at 700 yds for a Vertical Replenishment of stores and a personnel transfer.

Your exercise is to conduct the following communications: Encode the given signals, log and break signals from your partner, and provide any required responses. For some signals, you have the response; for others you will have to write your own. The conversations should be initiated in numerical order. You have some signals; your partner has the others.

For time, log all corresponding signals (initial and response) with question number as minutes (i.e., signal three at time XX03).

1. Perform a comm check with USS PORTER.
2. Assume Tactical Command of USS PORTER.
5. Give PORTER course and speed for UNREP.
6. Ask PORTER what they require during the UNREP.
9. Give PORTER delayed execute order to come alongside STBD side.
11. Give the order requested by PORTER in step 8 as an immediate execute.
13. Give PORTER order to take station for VERTREP.

14. Inform PORTER you intend to start VERTREP Helo ops at ____ time.
16. Tell PORTER you will use the helo to conduct personnel transfer.
19. Find out problems with the aircraft.
20. Order PORTER to stay within sight of aircraft and conduct rescue using small boat.
23. Tell PORTER good job and release her from tactical command.
25. Remind PORTER of ROE - no action until contact is identified.
27. Tell PORTER to engage contact in 24.
30. Inform PORTER that you are proceeding into port.

Naval Operations and Seamanship -- Shiphandling and Joint Operations

Radiotelephone Exercise 2

Communications Log

Time	To	From	Coded Signal	Broken Signal

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP
LABORATORY 3**

Radiotelephone Exercise 2

ANSWER KEY

To conduct this exercise, divide students into teams of two. Give half the students the Group 1 conversation (USS PORTER) and half the Group 2 (USS SUPPLY) conversation.

Students are provided the following information:

Call signs for today:

WASHINGTON Strike Group	B7G	WASHINGTON	G3W
PORTER	D9H	SUPPLY	S6A

For USS PORTER: course 230deg True, Speed 18 kts.

For USS SUPPLY: course 180deg True, Speed 20 kts.

UNREP: course 180deg True, Speed 13 kts.

Ships will be performing an underway replenishment for transfer of DFM and JP-5, followed by an Emergency Breakaway Exercise. Then, they will conduct a vertical replenishment.

Each student has approximately half the conversation, although some of the signals will require the student to write their own response based on given information. It is recommended students prepare their own signals for homework, and then conduct the conversation in an in-class exercise or as homework.

For time, students should log all corresponding signals (initial and response) with question number as minutes (i.e., signal three at time XX03).

The following are the encoded signals in order for ease of reference:

1. Perform a comm check with USS PORTER.
D9H DE S6A, K.
2. Assume Tactical Command of USS PORTER.
D9H DE S6A CD3-2 (DESIG D9H).
3. Request course and speed from USS SUPPLY.
S6A DE D9H, INT Corpen, BT, INT Speed, K.
4. Ask SUPPLY to report time to start UNREP.
S6A DE D9H, BD RN12-5, K.
Expected Reply: S6A DE D9H, RN12-5-1030T.
5. Give PORTER course and speed for UNREP.
D9H DE S6A, D Corpen 200-13 or (BT, A Speed 13.)
6. Ask PORTER what they require during the UNREP.
D9H DE S6A, INT UR6-3-28, BT UR6-3-26, K.
Expected Reply: S6A DE D9H, UR3, BT UR3-95, K. (or UR6-1-26-?? A, B, C, D, etc).
7. Request permission from SUPPLY to perform an Emergency Breakaway exercise.

8. Tell SUPPLY that she will provide the transfer rig.
S6A DE D9H, BH CA1-7-34, K.
9. Give PORTER delayed execute order to come alongside STBD side.
D9H DE S6A, XTF Station V-6STBD, K.
D9H DE S6A, Station V, Stby...X, K.
10. Tell SUPPLY to use flaghoist. Tell SUPPLY you are ready to come alongside.
S6A DE D9H, CS7-1, BT, BF Station V-6. K.
11. Give the order requested by PORTER in step 8 as an immediate execute.
D9H DE S6A, IX CA1-1-34 IMI IX CA1-1-34, Stby...X, K.
12. Request new course and speed.
S6A DE D9H, INT D Corpen, K.
13. Give PORTER order to take station for VERTREP.
D9H DE S6A, Station V-1, K.
14. Inform PORTER that you intend to conduct Helo ops for VERTREP starting at _____ time.
D9H DE S6A, SK23-2-T1200, K.
15. Tell SUPPLY that you are ready to recover her helo and report winds.
S6A DE D9H, BF SK34-7-E, BT, WE2-170-13, K.
16. Tell PORTER you will use the helo to conduct the required personnel transfer.
D9H DE S6A, SK23-3, K.
17. Report as Emergency that aircraft has been shot down.
S6A DE D9H, EMERG D IMI EMERG D (or emerg r), BT 7D, K.
18. Correct earlier report: Emergency report that helo is down.
S6A DE D9H, NEGAT 7D BT EMERG D IMI EMERG D BT SK18-2 DESIG 8, K.
19. Find out problems with the aircraft.
D9H DE S6A, INT SK27, K. or D9H DE S6A, INT SK17, K.
20. Order PORTER to stay within sight of the aircraft and conduct rescue using small boat.
D9H DE S6A, TL28-8 DESIG (HELO), BT, SA15-3-C or TL41-13 DESIG (Helo) or TL56.
21. WASHINGTON has requested permission to enter port. Tell her status of channel.
G3W DE D9H, CG7-1, K.
22. Report number of personnel rescued and their status. Request any required medical asst.
S6A DE D9H, SK17-8-D (or A, B, C), BT, SA17, K.
23. Tell PORTER good job and release her from tactical command.
D9H DE S6A, BZ, BT, BI CD3 (or TL21).
24. Inform SUPPLY of unidentified aircraft on bearing 350deg True, 75nm.
S6A DE D9H, EMERG A-350-75, K.
25. Remind PORTER of ROE - no action until contact is identified.
Flag 7B 350.
26. Identify the radar contact as an enemy.

- S6A DE D9H, RD1-1-D, K.*
27. Tell PORTER to engage contact in 24.
Flag 7A-4-A350.
28. Tell SUPPLY as you comply with the order in 27.
S6A DE D9H, JJ4-3 DESIG 350, K.
29. Inform PORTER that you are proceeding into port.
D9H DE S6A, BG TL41-21, K.
30. Report status of target.
S6A DE D9H, PB3-2, K.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP
LABORATORY 3**

RADIOTELEPHONE EXERCISE 3 (ENCODING)

- A. Call sign assignments:
- | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| M4M | R3B | B1N | D1A | G7X | Y2F | N5E | F5N | G3G | A6J | W1J | E2T |
| J70 | D4G | P2S | Q6T | S9T | E3W | H9B | O8F | X6P | V2A | C8I | I2R |
| T4H | B4B | | | | | | | | | | |

OTC: P6V Collective: C4M

*Remember: You must respond in ALPHA-NUMERIC ORDER, so it might be wise to rearrange these call signs in alpha-numeric order **BEFORE** the exercise.*

- B. Encode the following ideas using the NROTC Exercise Signal Book and prepare them for transmission. If specific time of transmission is not given, come up with one yourself. You will be called upon to transmit one of the following five signals:
1. Using the delayed executive method, send the following to call signs B7J, C6V, and N9P: "Form a sector screen about my present position. Call sign N9P, you take sector from 040 degrees true to 075 degrees true, from 6,000 to 10,000 yards. Call sign C6V, you take sector from 310 degrees true to 010 degrees true, from 1,000 to 10,000 yards. Call sign B7J, you take sector from 210 degrees true to 290 degrees true, from 3,000 to 12,000 yards. Upon execution of the signal, my course will be 020 degrees true at 15 knots. Use a stationing speed of 23 knots."
 2. Tell call sign P6V that your ship will act as the visual relay ship for call sign C6V at 1630 and that you plan on granting regular liberty upon arrival at 1630.
 3. Tell P6V that you plan to send your motor whaleboat over in the morning to pick up mail and that you plan to use visual means of recognition.
 4. The formation consists of call signs N9P, C6V, and B7J in a line abreast with your ship. Standard distance is 1,000 yards. Course is 090 degrees true, speed 15 knots. Your ship is on the port wing of the line and **N9P** is the guide. At 1230 local (time zone Q), send an immediate execute signal to the formation, wheeling it to new course 175 degrees true. Identify the guide as required.

5. Send the following to call sign C6V: Do not fight a retiring action, or use ammunition with impact fuses. Commence gunfire support on blue beach at 1430.

RADIOTELEPHONE EXERCISE 3 (DECODING)

C. Decode the following:

1. C4M DE P6V, CA1-1, BREAK, TIME 1710Z, OVER
2. "ROGER OUT" FROM
A6J E3M M4M S9T G3G B1N F8N O8F V2A N5E C81

G7X P2S W1J X6P D4G H9B Q6T D1A E2T J70 R3B
Y2F
3. C4M DE P6V, IX, TURN STBD 7, IMI, IX, TURN STBD 7,
STANDBY...XT, BREAK, TIME 0947Z, BREAK, A6J, D1A, K
(DE A6J, ROGER OUT), (DE D1A, ROGER OUT)
4. C4M DE P6V, SK14-1E-480, BREAK, TIME 1234Z, BREAK, E3W,
K
(DE E3W, ROGER OUT)
5. C4M DE P6V, WE5-3-6-BE-RY6-1, BREAK, TIME 1414Z, BREAK,
M4M, V2A, W1J, K
(DE M4M, ROGER OUT), (DE V2A, ROGER OUT),
(DE W1J, ROGER OUT)
6. C4M DE P6V, XTF, BREAK, FORM G PORT-7, BREAK, TIME
1650Z, BREAK, C8I, F8N, Y2F, K
(DE C8I, ROGER OUT), (DE F8N, ROGER OUT),
(DE Y2F, ROGER OUT)
7. C4M DE P6V, BT, STANDBY...EXECUTE, BT, TIME 0620Z, BT,
O4G, E2T, K
(DE G7X RAR), (DE E2T RAR)
8. C4M DE P6V, BT, CR1-B-CR5-250-14-18T, BT, TIME 1520Z,
BT, G7X, J70, G3G, K
(DE D4G RAR), (DE J70 RAR), (DE G3G RAR)
9. C4M DE P6V, BT, SCREEN R-T16ANS, BT, TIME 1545Z, BT,
F1N, R3B, S9T, K
(DE B1N RAR), (DE R3B RAR), (DE S9T RAR)
10. C4M DE P6V, BT, CA1-5-40J DESIG THIS PORTION I SPELL
THIS, T-H-I-S, THIS, PORTION, P-0-R-T-I-0-N, PORTION,
BT, TIME 1730Z, K
11. "ROGER OUT" FROM
A6J P2S B1N Q6T C8I R3B D4G S9T E2T V2A E3W
W1J F8N D1A G7X Y2F H9B G3G J70 N5E M4M X6P
O8F

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 10

HOURS: 1

TITLE: Tactical Maneuvering Exercise

I. Learning Objectives

- A. The student will comprehend the use of the NROTC Signal Book and "International Code of Signals" (H.O. 102).
- B. The student will combine both signal book and maneuvering board knowledge in order to complete a tactical maneuvering exercise.

II. References and Texts

- A. Instructor references
 - 1. NROTC Exercise Signal Book
 - 2. International Code of Signals, Publication H.O. 102
- B. Student text: NROTC Exercise Signal Book

III. Instructional Aids

- A. Maneuvering-board worksheets
- B. Flaghoist trainer (optional) or flag cards set
- C. Computer-aided instructional software (optional)
 - 1. Navigation Simulator
 - 2. Maneuvering board
 - 3. Flags
- D. Computer (optional)
- E. Projection pad (optional)

IV. Suggested Methods and Procedures

- A. The attached sample exercise is intended for use over three class periods. It is recommended that you divide the class into groups of 4-6 students, placing emphasis on completing each signal quickly and correctly. Encouraging the groups to compete is an excellent way

to promote enthusiasm and teamwork. The attached exercise starts out with very basic encoding/decoding problems, then builds up to a semi-complex maneuvering exercise. For each problem, the student should prepare a report similar to the report that an OOD must make to the CO for any tactical signal.

- B. The computer-aided instructional software can be used as a tool to give the students a more tangible grasp of the material.
 - 1. By using the "Navigation Simulator" software, one of the groups can be a bridge-watch team and actually maneuver the ship through various exercises. This will give a feel for the real-time aspect of the bridge environment and the demand for information in a timely manner.
 - 2. The "Maneuvering Board" software may be better used in earlier lessons. However, it can be used effectively both to show the radar response to students' actions, as well as a quick check of their answers in the exercise.
 - 3. The "Flags" software can be used to send and receive signals.
 - C. The instructor is encouraged to prepare a similar written exercise for the students to take home for practice prior to the in-class portion.
- V. Presentation: Conduct the tactical signals/maneuvering exercise with the instructor playing the role of both officer in tactical command (OTC) and commanding officer.
- A. The attached Laboratory 4 shall be used as the basis for this exercise. It provides signals that require action on the part of several groups and allows for simultaneous maneuvering board practice.
 - B. Recommend dividing students into teams of two or more, assigning call signs and having them perform the maneuvering board practice as prescribed by the provided signals.
 - C. Emphasize that the students prepare a report to the CO for each signal (i.e., time of signal, meaning of signal, current tactical situation vs. new tactical situation, course to station, speed to station, time to station, and bearing and range to the guide when on station).

- D. Following each maneuver, have students report or log their bearing and range to the guide, as well as course and speed to station.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LABORATORY: 4

HOURS: 1

TITLE: TACTICAL MANEUVERING EXERCISE

<u>Assigned Units</u>	<u>Call Sign</u>	<u>Sequence Number</u>
USS SHOUP (DDG 89)	R2W	4
USS CHOSIN (CG 65)	Q6T	2
USS DETROIT (AOE 4)	C4F	8
USS CHAFEE (DDG 90)	S8M	5
USS ABRAHAM LINCOLN (CVN 72)	V3F	1
USS DECATUR (DDG 73)	B5Y	6
USS FORD (FFG 54)	K9L	7
USS PRINCETON (CG 59)	A1N	3
COMCRUDESGRU 1	P6V	
ALL UNITS	U7G	

A. DECODE:

1. U7G DE P6V, XTF, BT, FORM 7 - F FORM - 3 - V3F - TL13 -
2 - 10 - CORPEN G - 035 - SPEED F - 15 - W SPEED - 25,
BT, K
2. U7G DE P6V, WE3 6 - WE5 - 3 - 6 - UR3, BT, TIME 1015Z,
BT, R2W, V3F, Q6T, K
3. U7G DE P6V, BT, RD4 -BV - 3I, BT, TIME 1016Z, BT, Y5F,
K9L, K
4. U7G DE P6V, STANDBY...EXECUTE, K
5. U7G DE P6V, RN15 - 6 - 2, BT, TIME 1019Z, BT, A1N, K
6. V3F DE P6V, BT, SK21 - 8 - 1330Z, BT, K
7. U7G DE P6V, BT, SH63 -E- 7P, BT, TIME 1021Z, BT, B5Y,
C4F, K
8. U7G DE P6V, BT, 2E - 1, BT, TIME 1024Z, BT, R2W, Q6T, K

B. ENCODE:

1. "REQUEST PERMISSION TO PROCEED ON DUTIES ASSIGNED"
2. "I RECOMMEND USE OF THE FLAGHOIST METHOD"
3. "FORM A LOOSE LINE OF BEARING ON THE GUIDE ON COURSE
240T AT A DISTANCE OF 2,000 YARDS. THE GUIDE IS
LINCOLN (CVN 72) "

4. "I AM ASSUMING TACTICAL COMMAND OF YOUR UNIT" (SEND MESSAGE TO C/S A1N)
5. "CHEMICAL WARFARE ATTACK BY AIRBURST BOMB IS IMMINENT"
6. "I AM PREPARED TO FIRE A WARNING SHOT ACROSS THE BOW WHEN DIRECTED"
7. "SONOBUOY CONTACT BEARS 273T AT A RANGE OF 3NM"
8. "ASSUME TACTICAL DIRECTION OF RECONNAISSANCE AIRCRAFT BY 1800Z"

C. **TACTICAL MANEUVERING** (THE FORMATION BEGINS IN THE FORMATION DESCRIBED IN SIGNAL A.1 ABOVE):

1. U7G DE P6V, TURN STBD 9, BT, Q6T, K9L, K
2. U7G DE P6V, CORPEN STBD 7, BT, C4F, S8M, K
3. U7G DE P6V, XTF, BT, SCREEN J - ZZ DESIG C/S C4F - 1216 - 07ANS11 DESIG C/S V3F - 16ANS20 - 0408 DESIG C/S Q6T - 2327 - 0509 DESIG C/S R2W - 28ANS32 - 0307 DESIG C/S S8M - 0307 - 0725 DESIG C/S K9L - 0811ANS - 0611 DESIG C/S B5Y, BT, K
4. U7G DE P6V, BT, WE2 - 20 - 140, BT, TIME 1030Z, BT, C4F, V3F, K
5. U7G DE P6V, STANDBY...EXECUTE, K
6. U7G DE P6V, BT, IX, FORM 7 - CORPEN G - 220 - SPEED F - 10; IMI, IX, FORM 7 - CORPEN G - 220 - SPEED F - 10, STANDBY...EXECUTE, K
7. U7G DE P6V, XTF, BT, FORM C, BT, TIME 1035Z, BT B5Y, S8M, K
8. U7G DE P6V, XTF, BT, SPEED F - 20, BT, R2W, Q6T, K
9. Q6T DE P6V, BT, INT PB7 - PREP 2J - 3, BT, K
10. U7G DE P6V, BT, FORM C, STANDBY...EXECUTE, BT, V3F, K9L, K
11. U7G DE P6V, BT, SPEED F, STANDBY...EXECUTE, BT, S8M, Q6T, K
12. U7G DE P6V, BT IX, FORM B; IMI, IX, FORM B, STANDBY...EXECUTE, K

13. U7G DE P6V, BT, IX, TURN STBD 9; IMI, IX, TURN STBD 9,
STANDBY...EXECUTE, BT, B5Y, K9L, K

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 11

HOURS: 1

TITLE: Watchstanding

I. Learning Objectives

- A. The student will know the key positions in the shipboard watch organization.
- B. The student will understand each person's duties and responsibilities within the watch organization.
- C. The student will know the requirements for, and be able to demonstrate, a proper watch relief and the requirements, procedures and format for keeping the ship's deck log underway, in-port, and at anchor.

II. References and Texts

A. Instructor references

- 1. Watch Officer's Guide, pp. 13-47, 146-171, and 204-237
- 2. OPNAVINST 3120.32, "Standard Organization and Regulations of the U.S. Navy," Chapter 4, Articles 433 and 453 (Available at: <http://neds.daps.dla.mil/>.)
- 3. Seamanship: Fundamentals for the Deck Officer, pp. 16-78
- 4. "Organizational Structure" Handout (attached)
- 5. "Officer of the Deck Study Guide" (attached)

B. Student texts

- 1. Seamanship: Fundamentals for the Deck Officer, pp. 16-78
- 2. Watch Officer's Guide, pp. 13-47, 146-171, and 204-237
- 3. "Organizational Structure" Handout (attached)
- 4. "Officer of the Deck Study Guide" (attached)

III. Instructional Aids

- A. Video: "Melbourne/Evans Incident--I Relieve You Sir", 35 minutes
- B. VCR/Monitor
- C. Chalkboard/whiteboard

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Lecture/Discussion: Instructor should distribute the attached handout detailing the underway and inport watch organization or provide an instructor-prepared handout.
 - 2. Handout/Review: For use with Lessons 10 and 11, instructor should distribute the attached "Officer of the Deck" handout discussing watch standing, turnover, and engine orders or provide an instructor-prepared handout. (**NOTE:** The review sheet may also be useful to midshipmen preparing to go on first-class cruise, since it incorporates a review of engine and rudder orders, watch turnover procedures, terminology, and other useful information for OODs.)
 - 3. The video should be viewed following a discussion of watchstanding and the watch organization. Be sure to allow enough time for an extensive class discussion.
- B. Procedural and student activity options:
Lecture/Discussion

V. Presentation

- A. Watchstanding
 - 1. Discuss the inport watch organization as it relates to the following:
 - a. Commanding officer
 - b. Executive officer
 - c. Command duty officer
 - d. Officer of the deck
 - e. Petty officer of the watch

- f. Messenger of the watch
 - g. Duty department heads
 - h. Inport fire party
 - i. Security alert team
 - j. Security patrols -- "Roving Patrol" and "Sounding and Security"
- 2. Discuss the underway watch organization
 - a. Commanding officer
 - b. Executive officer/Navigator
 - c. Tactical action officer
 - d. Officer of the deck
 - e. Junior officer of the deck/watch
 - f. Combat information center watch officer
 - g. Engineering officer of the watch
 - 3. Discuss the concepts of responsibility, accountability, and delegation of authority as they pertain to the performance of watchstanders afloat and ashore.
 - 4. Discuss the significance and relationship of standard operating procedures/procedural check-off lists and formality in watchstanding, operational effectiveness, and material management.
 - 5. Discuss the requirements for conducting a proper watch relief.
 - a. Readiness condition
 - b. Operational status of major ship systems
 - c. Tactical picture
 - d. Schedule of events
 - e. Weather
 - 6. Discuss the responsibility of the officer of the

deck or the command duty officer to carry out the ship's routine.

7. Discuss the ship's deck log for underway, inport, and at anchor.

B. Summarize lesson and review handouts.

Naval Operations and Seamanship
Watchstanding

ORGANIZATIONAL STRUCTURE

Organization - The Bridge Watch Team:

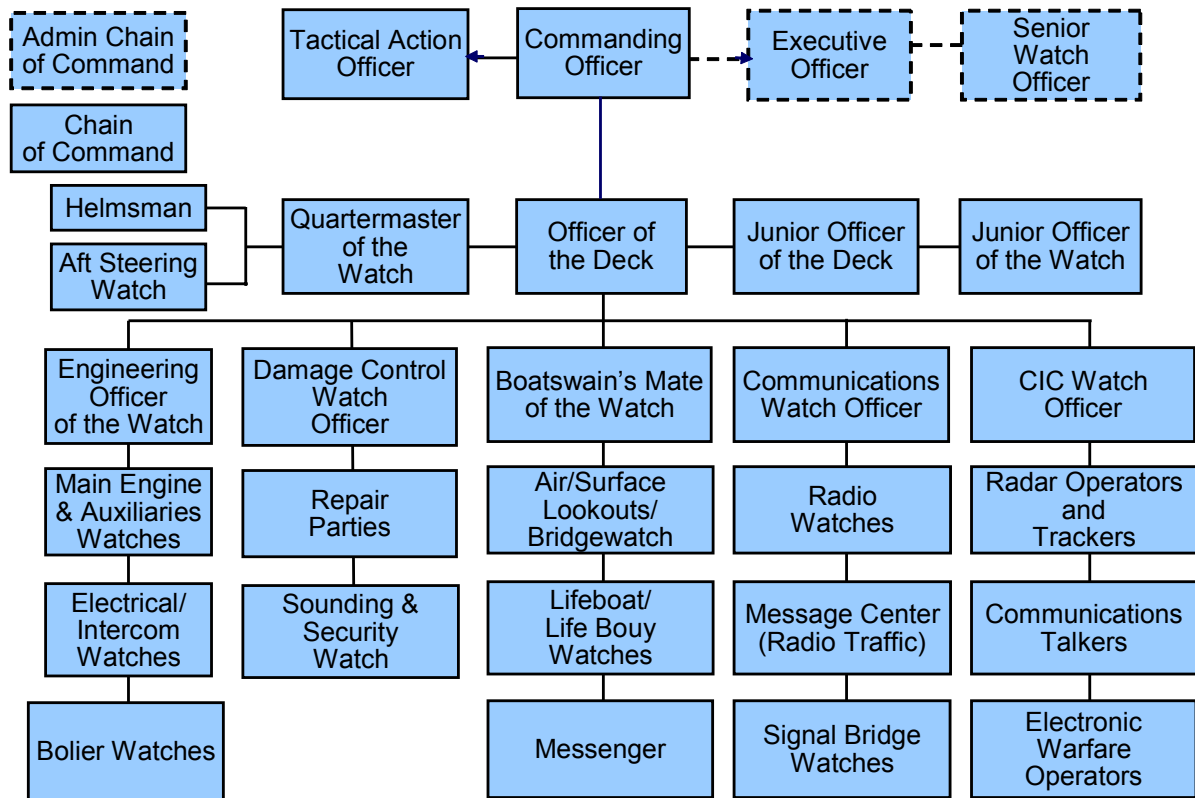
- Officer of the Deck (OOD): The officer on watch in charge of the ship. Responsible for maintaining the ship's routine, controlling all shipboard evolutions, and, most importantly, the safe navigation of the ship.
- Conning Officer: The officer on watch who actually directs the ship's movement by giving engine and rudder orders. Works for the OOD.
- Quartermaster of the Watch (QMOW): Maintains the navigation plot for the OOD. Makes appropriate recommendations concerning navigational matters, and also maintains the deck log and makes weather observations.
- Boatswain's Mate of the Watch (BMOW): The enlisted leader of the watch team. All other enlisted personnel on the bridge team work for the BMOW. Primary duties include making LMC announcements and directing the rotation of the lookouts and helmsman.
- Lookouts: Responsible for monitoring for other vessels by sight and hearing, and informing the OOD of all contacts observed.
- Helmsman: Controls the ship's rudder, and, unless a lee helmsman is stationed, the engines.
- CIC Watch Officer (CICWO): Stands watch in the Combat Information Center (CIC) and provides the OOD with recommendations based primarily on radar information.

Organization Relationships of the OOD:

- **With the CO**
The OOD reports directly to CO for the safe navigation and general operation of the ship.
- **With the XO**
The OOD reports to the XO on matters regarding ship's daily routine. May relieve the OOD in times of emergency or danger.
- **With the TAO/CICWO**
If authorized by ship's doctrine, the TAO may direct the OOD in the tactical handling of the ship.
But the OOD retains responsibility for the safe navigation of the ship
- **With the Navigator**
Dual responsibility for "safe navigation of the ship"
The Navigator may relieve the OOD if the OOD is endangering the ship from a navigation standpoint (if authorized in writing).
- **With the EOOW**
The EOOW reports to the OOD, but may have authority to take control of the plant for emergency actions.
EOOW reports to OOD: start/stop turbines
OOD reports to EOOW: proximity to land, speed requirements, etc.
- **With the JOOD/JOOW**
Principal assistants to the OOD.



Underway Watch Organization



Navy Military Training - Shipboard Watch

22-1-3

Officer of the Deck Study Guide

Watch Turnover

Prior to relieving the watch, visit:

CCS: Plant configuration and equipment casualties

CSMC: Equipment status and degradations

CIC: Tactical Briefing

Relevant Files and Instructions:

OOD Pass Down Log

Standing and Night Orders

OOD Message Boards

Deck Log

Battle Orders

Obtain from the off-going section:

Weather conditions affect maneuvering: visibility, sea state, wind

Status of visual contacts: identity, maneuvering requirements, restrictions

CPA, reported to Captain?

Plant Status

CO's Location

Directives:

Schedule of Events	EMCON Status
Intelligence Reports	Air Plan, Flight Sched
OpPlans	OpTasks
OpOrds	Governing ROE

Check status boards and displays:

- Engineering plant, maneuvering limitations
- Combat Systems casualties, Estimated Time of Repair
- Active Surface combat and picture
- Voice Comms: call signs
 - circuits comb/bridge
 - crypto sys/time of change
 - id and location of OTC, comms, alternates, C/Ss

Examine the Nav Chart

- O/s PIM and position, DR
- Charted water depth, bottom type, sig changes expected
- Rendezvous and reference points
- Proximity of land and territorial waters, warning areas
- Nav Hazards and aids
- Expected visibility and radar landfall

Determine from Observed, displays, OOD Briefing

- air/surface/subs threat axis, enemy locations and movements
- force directed, condition of readiness set
- tactical formation, screen, units to join/detach
- O/s station and boundaries; course, speed, maneuvering restrictions
- Quiet ship status

Sensor Status

- EMCON and systems affected
- Active sensor operating modes, standby modes, restrictions, ranges
- Passive sensor capabilities, modes, assigned, ranges

Weapons Status

manning and readiness	threat response modes implemented
ordnance loaded and on station	control stations

Standing, Night and Battle Orders

Standing Orders: Captain's orders dictating the job of the OOD, when to call, waters definitions, relationship to other watchstanders

Night Orders: Additional information applicable to that night; where we are who we are with, where to be, what to do, when to call

Battle Orders: Dictate use of weapons systems and role of combat

Bridge Logs and records

Deck Log: maintained by the QMOW

- lists all crs, speed changes and rudder used
- lists time CO on and off the bridge
- lists who has deck and conn and relieved officer's signature
- lists all injuries to personnel, status of equipment, and flight statuses

Fleet Tac Log: maintained by the Tactical Communicator

- lists all tactical signals passed, from and to whom

Bridge to Bridge Log: maintained by Tactical Communicator

- logs all communication to or from Port Royal over BTB communicators, channel, time and date

Waters Classification

Transit	Distance to Shoal Wtr	Depth (fath)	Fix Frequency	Navigation Detail
Restricted Water	Less than 2 nm	Less than 20	2 min	Full Nav Detail 30 min prior to entering
Piloting Waters	2-10 nm	20-100	3-15 min	modified detail as directed by Navigator
Coastal Water	10-30 nm	20-100	15 min	QMOW
Open Ocean	Greater than 30 nm	More than 100	30 min	QMOW

Maneuvering

Controllable Forces

Engines/screws	Rudders	Anchors	Lines
Tugs/Bow and stern thrusters	Anchors		

Uncontrollable Forces

Wind	Current
------	---------

3-2-1 RULE

Carrier:	6000yd bow	4000yd beam	2000yd astern
Ship:	2000yd bow	1000yd beam	500yd astern

3 minute rule distance traveled in 3min = speed x 100

Dumping/Pumping Limits

3nm CHT	12nm Make water
25nm Trash	50nm Pump Bilges

When to Call the Captain

Come on Deck at Once! Captain to the Bridge

1. Disagreement between OOD and TAO regarding safe navigation during tactical operations
2. Report upon relieving the watch
3. If ill or otherwise unable to stand the watch (must wait for relief if already assumed watch)
4. If in doubt about movement of PORT ROYAL in relation to any other ships
5. Emergencies of any kind, including personnel injuries
6. Any occasion when PORT ROYAL or other ships in formation are out of station
7. Disagreement between OOD and CIC
8. Need to relocate the after lookout
9. Compass comparison discrepancies
10. Speed and course changes greater than five degrees or two knots
11. Sightings or failure to sight nav aids within 15 minutes/10 degrees (also radar/visual landfall)
12. Weather changes (.04"/hr, .1"/3 hr barometric, 10kt/20deg wind shift)
13. Need to station crewmembers topside in heavy weather
14. Helo traversing and green deck
15. Challenges to Port Royal

Responsibilities of the Officer of the Deck

Conduct of the Watch

Compliance with the Standing Orders

Keep the Commanding officer informed quickly and fully

Notifying the XO

Changes of the Plan of the Day:	Schedule	Working Parties
	Flight Quarters	Passing the Word

Notifying the Navigator

Deviation from predicted DR position >15min, lateral offset>1/2nm coastal, 5nm open ocean
 Discrepancy of compass comparisons done every 30 minutes, every course change
 Course change >=15 deg, speed change >=2knots
 Sight a navigational aid
 * Navaid not sighted within 15 minutes or 10degrees of expected bearing
 Change in weather: barometric pressure/wind direction and speed

Relationship with the TAO

Orders from: direct employment of the weapon's systems subject to the CO's negation
 OOD will follow TAO's recommendation unless such directions or maneuvers cause imminent danger to the ship
 Conflict: call the CO immediately

EVERYONE ELSE WORKS FOR YOU!

Contact Report

CPA inside 5nm, report at 10nm	Radar/visual contact
Contact relative bearing, target angle, range	Bearing drift
Contact course and speed, navigational lights	Meeting, crossing, overtaking
Type of vessel	CPA: bearing, range, time
PRL's course and speed	We are Give-way or Stand-on
Radio contact/bridge-to-bridge	Recommended action

"Captain, this is ___, the Officer of the Deck, time is___. Contact visually/on radar bearing ___degrees relative, at ___ yds. The contact has right/left/no bearing drift and a target angle of ___. Contact's course is ___degrees True at ___kts. Visually hold ___navigation lights. This is a meeting/crossing/overtaking situation. CPA will be ___degrees relative at ___yds, in ___min. Port Royal's course is ___degrees true at ___kts. We are the stand-on/give-way vessel. I have/have not made bridge-to-bridge contact. I intend___.

Navigation Detail

Regular	set 30 minutes prior to entering restricted waters (2nm from shoal water)		
Bridge: Evaluator	Plotter	Bearing recorder	Bearing takers
Leadsman talker, sndg	Fatho Operator	Surface Srch radar	QMOW
CIC: Piloting officer	Shipping Officer	Nav Radar Operator	
Plotter	Recorder		
Modified	may be set at Nav's direction within 10nm of any hazard to navigation		
Bridge: Evaluator	Plotter	Bearing, radar taker	QMOW, log keeper
CIC: Piloting Officer	Radar Operator Plotter	Recorder	

Orders

Watch Turnover:	Oncoming OOD:	"I am ready to relieve you"
	Offgoing OOD:	"I am ready to be relieved"
	Oncoming OOD:	"I relieve you, sir/ma'am"
	Offgoing OOD:	"I stand relieved."

Offgoing OOD:	"Attention in the Pilot House, this is LT ____, ENS ____ has the deck/conn."
Oncoming OOD:	"This is ENS ____, I have the deck/conn."

Helm Orders:

Right full rudder, steady on course 270.

- A. Direction of Rudder - right or left
- B. Amount of Rudder - standard, full, 5°, 10°, 25°, etc.
- C. Course to Steer - in degrees

Rudder amidships

Increase your rudder, ease your rudder

Shift your rudder

Steady as you go

Meet her

Rudder to the center position

Change the rudder angle – ship will turn more/less quickly

Move the rudder to the same angle in the opposite direction

Steer the crs on which the ship is heading when order given

Use rudder as necessary to check, but not stop, ship's turn.

This order is given to prevent the ship swinging past new

crs.

Mind Your Helm

Come Left/Right, Steer Crs ____

Order is a warning to steer more exactly

This order is given for course changes of less than 10degrees

Engine Orders:

All engines ahead two-thirds, indicate turns for 10 kts

- A. Engine Desired - port, starboard, all
- B. Direction Desired - ahead, back, stop
- C. "Bell"/Speed range - 1/3, 2.3, Standard, Full, Flank
- D. Revolutions desired - "indicate turns for ____ kts."

% Pitch commands

Restricted Maneuvering

Zero Thrust

Small Boat Operations

Considerations

Speed 3-5knots	Never back down	Winds on leeward side
Ship between M/V and boat		

- ___ Man the boat detail
- ___ Break Life lines (with CO's permission)
- ___ Boat off skids
- ___ Boat at rail
- ___ Boat in water
- ___ All steady lines cast off
- ___ Sea painter cast off (connection line)
- ___ Boat away to port/starboard
- ___ Life lines in place
- ___ Secure boat detail
- ___ Comms: handheld, BTB radio
- ___ Direct boat to/from destination

Helo Operations

The Officer of the Deck shall:

- maintain communications with the flight deck, LSO, CIC, and HCO
- maneuver as necessary to provide favorable winds
- display required signals (restricted ability to maneuver, Hotel)
- inform CO of helo operations
- request permission from CO to traverse helo, commence helo ops, green deck, etc.
- Maintain steady course and speed at green deck and traversing, course at amber deck
- ensure that obstructions are lowered or removed
- notify HCO/LSO prior to course/speed changes during flight quarters

General Notes:

- Never secure flight quarters until after Red Deck or Ops Normal report
- Never maneuver on a green deck
- Allow bridge phone talker to maintain focus on comms during final
- Always inform HCO/LSO of maneuvering during flight ops
- Know that different wind envelopes exist for different aircraft
- Limit 1MC announcements during Green Deck

Station personnel: Signal Bridge, Boat Deck, CCS, HCO tower, LSO shack, Flight Deck, CIC, AFFF 2

Test flight crash alarms when manned and ready

Requirements for helo ops:

- | | |
|--------------------------------|---|
| STBD Antenna lowered | Aft launcher deauthorized |
| Ensure SPY aft array inhibited | SGSI maintenance platform raised and pinned |

- ___ Come to Foxtrot Corpen
- ___ Give amber deck for rotor engagement
- ___ Obtain CO permission for green deck
- ___ Close up Hotel
- ___ Give HCO/LSO permission to commence flight ops
- ___ Make deck log entries:
 - take off time
 - recovery time
 - names of pilots
 - estimated time of recovery
 - names of souls on board
 - helo # or callsign
- ___ Inform CO of aircraft flight status

Maneuvering Restrictions:

- | | |
|---------------------------|---|
| Helo Chained in hangar | NONE |
| Straightening/Traversing | Maintain steady course |
| Helo on deck, chock/chain | NONE |
| Spreading/Folding blades | max wind across the deck = 45 knots (same for tail) |
| Amber Deck (dis/engage) | Maintain steady course |
| Green Deck (Inch/rcvr) | Maintain steady course, speed, wind picture |
| Refueling | gentle maneuvers only |
| HIFR | Wind 330-000 relative, minimum 15 kts, gentle maneuvers |

Man Overboard

- ___ Put the rudder over the same side as the man went over
- ___ BMOW: Pass "Man Overboard. Man Overboard, Port/Stbd Side"
- ___ Lookout: Throw a life ring with strobe light and smoke float attached to mark spot
- ___ Tell everyone available to point to man continuously until he is picked up
- ___ OOD: determine method of recovery
- ___ Anderson Turn (full circle, fastest) for daytime
- ___ Williamson Turn for night/low visibility
- ___ Racetrack (oval) clear weather or tail deployed
- ___ Y-backing Small Boat Helo
- ___ CIC: secure fathometer, sonar
- ___ Engineering should set restricted maneuvering (if at trail, come to split)
- ___ QMOW: log latitude and longitude of man overboard
- ___ BMOW: Sound six or more short blasts on ship's whistle
- ___ Sigs/QMOW: Hoist Oscar or Red/Red pulsating
- ___ CIC: provide constant bearing and range to the man, time in water
- ___ TACOMM: pass information to other ships in company
- ___ OOD: pass information as available to CO, XO
- ___ First LT: Man the Boat deck if small boat recovery is in order
- ___ First LT: Man forward recovery station, port/stbd side, establish communications

Underway Replenishment

- ___ Conduct Steering Checks within past 24 hours
- ___ UNREP brief, ensure know rendezvous point and point is plotted
- ___ Get to UNREP point
- ___ Post fuel type and quantity requirement on bridge
- ___ Set underway replenishment detail (45 minutes prior)
- ___ Confirm all internal nets
- ___ UNREP ship will take tactical control of us
- ___ Take lifeguard station (1000 yards astern)
- ___ Take waiting station (300-500 yards astern)
- ___ Set restricted maneuvering
- ___ Romeo at the Dip I am preparing to receive you alongside
- ___ I am preparing to come alongside
- ___ Romeo Closed Up I am prepared to receive you alongside
- ___ I am commencing my approach
- ___ Request permission to commence approach after reporting manned and ready to XO
- ___ BMOW: Port Royal is making her approach alongside ____
- ___ Close up Ball-Diamond-Ball
- ___ Request permission to shoot shotlines
- ___ Romeo Hauled Down Shotline in hand
- ___ Messenger in hand
- ___ Bravo Closed Up upon probe seated...receiving fuel
- ___ BMOW passes: The smoking lamp is out while taking on fuel
- ___ Prep at the Dip Fifteen minute Standby
- ___ Prep Closed Up Five minute Standby
- ___ Prep Hauled Down All lines clear
- ___ Play breakaway song, haul down day shapes, secure UNREP detail

Anchoring

Anchoring: dropping

Weighing Anchor: picking up

Anchoring

- ___ Man all stations
- ___ "Make anchors ready for letting go" centerline at dip, stbd at hawes
 - ___ 1000 yds, 5 kts
 - ___ 500 yds, 3 kts
 - ___ 200 yds, all stop
- ___ "Standby" Foc'sle removes stopper, let anchor and chain ride on brake
 - ___ 50 yds, backing bell
- ___ "Let go anchor" Foc'sle releases brake, will report when anchored
- ___ 6 shots payed out, brake set
- ___ Foc'sle relay anchor chain reports
- ___ Anchor hits bottom, anchor watch set
- ___ "Pass the stoppers" Foc'sle passes stoppers, reports
- ___ Anchor watch reports passed via Net 56 every 30 minutes
- ___ Take fix, plot drag and swing circles

Weighing Anchor

- ___ Man all stations
- ___ Light off and test capstans, engage wildcat
- ___ "Heave around on short stay" Foc'sle reports when at short stay
- ___ "Heave around and up"
- ___ Foc'sle reports:
 - ___ Anchor is breaking ground
 - ___ Anchor is up and down
 - ___ Anchor is aweigh
- ___ Underway
 - ___ Anchor is in sight
 - ___ Anchor is clear/fouled
 - ___ Anchor is shod -- dirty
 - ___ Anchor is at the dip
 - ___ Anchor is hawsed
- ___ "Secure anchor for sea" Foc'sle passes stoppers, reports

Differences between centerline and starboard anchors

Centerline: 12 shots Starboard: 9 shots 1 shot=15fathoms=90feet

Information required:

- Depth of water – length of chain is 5-7 times depth of the water
- Number of shots on deck (detachable link between stoppers and wildcat)
- Type of bottom (free fall: less than 15 fathoms, power: 15 fathoms or greater, rocky bottom)
- Head bearing: heading along which to anchor
- Drop bearing: heading where drop anchor (perpendicular to head bearing)
- Drag circle: hawespipe to pelorus (146ft) + length of chain (2 fixes (15min) outside – dragging)
- Swing circle: length of ship (567ft + length of chain) safe circle to swing

Flag uniform:

	Anchoring	Weighing anchor
at dip	anchor let go – port/stbd flag indicate anchor	heaving in

closed up	chain cable veered to required length	anchor aweigh
hailed down	chain cable secured	ready to proceed

Mooring

4 1/4" Kevlar Mooring Lines 6% stretch, sequential failure, 96,000lb safe working load

- Double up 3 parts of line holding to pier
- Ease let out until it is under less tension
- Hold Do not allow anymore line to go out even though risk of parting may exist
- Check Hold, but not to breaking point
- Surge moderate tension; allow to slip enough to permit movement

Bow line, aft spring line, fwd spring line, aft quarter line, fwd quarter line, stern line

Mooring to buoy:

trolley method: tensioned wire, lower anchor chain then hook shackle
never allow RHIB to place itself between ship and buoy

Mooring evolutions:

Key to twisting: maintain one constant, change the other
Once alongside, mostly in terms of pitch percentages and small angle changes

Tugs:

Lateral motion Max speed=2kts, otherwise tugs will slide
commands: ahead/back easy/half/full

Plane Guard Checklist

- ___ Determine sunset...expect to maneuver to station 30 minutes prior to sunset
- ___ Check communications circuits...Fleet Tac, Navy Red, Bridge to Bridge
also, flashing light, flaghoist, Stennis land/launch, Marshall, etc
- ___ Inform CCS of Plane Guard Assignment 30 minutes prior
- ___ Brief lookouts and signalmen of their responsibilities
- ___ Come up to Full Power
- ___ Thirty minutes prior to stationing "The ship is maneuvering to Plane Guard station on USS Stennis. Man the boat deck."
- ___ Ensure a copy of the flight plan is on the bridge.
- ___ Ensure stadimeter is set and ready.
- ___ Ensure ready life boat is manned
- ___ Receive an update on true winds
- ___ Energize aircraft warning lights and navigational lights set to bright

Signals to expect

I am assuming/resuming tactical command of this unit
Take rescue/destroyer station
Keep within range of this unit or indicated units
Take station relative bearing 170 from the guide at standard distance
Alter course by wheeling in direction indicated
My rudder is left/right as indicated

Helpful Hints

- If in doubt, call the carrier and request information about her intentions
- When working a stationing solution or intercept, point at her STERN

- If a flight crash on deck, she will maneuver to keep smoke/flames away from the island
- Man Overboard: conduct recovery as directed by carrier
- Downed Aircraft: conduct recovery under direction of carrier

- If the carrier hauls out to starboard, pick up speed to full and turn thirty-fourty degrees to port
- If the carrier hauls out to port, pick up speed to full and turn thirty degrees to starboard
- Wait until the carrier is on the beam, then follow her around, pointing the stern
- If she is on a recovery leg, it is imperative to maneuver to station as rapidly and safely as possible

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 12

HOURS: 1

TITLE: The Roosevelt/Leyte Gulf Collision Case Study

I. Learning Objectives

- A. The student will comprehend the importance of sound watchstanding procedures and communication between ships in close company.
- B. The student will understand the need to make quick decisions in crisis situations.

II. References and Texts

A. Instructor References

- 1. "Expect the Unexpected," *Fathom*, Oct-Dec 97 (attached)
- 2. "Your Worst Nightmare . . . a Collision at Sea," *Navy Times*, 21 Apr 97 (attached)
- 3. Watch Officer's Guide

- B. Student Text: Distribute copies of "Expect the Unexpected" and "Your Worst Nightmare" (attached).

III. Instructional Aids

- A. Course Syllabus
- B. Chalkboard/whiteboard

IV. Suggested Methods and Procedures:

- A. Lecture
- B. Discussion

V. Presentation

- A. Have students read the attached articles on collisions.
- B. Review Lessons 10 and 11.
- C. Discuss the accident. Talk about the mistakes that were made and how they could have been avoided. Discuss operations with the carrier and the difficulties

associated with nighttime formation steaming. The list of mistakes may include:

1. TR failed to communicate her intentions for the evening with LG. Due to the fact that LG would be acting as plane guard in such close proximity to TR, it is vital that she know what was planned.
 2. TR failed to notify LG of course and speed changes. When in such close proximity, it is very important for the carrier to notify other ships in company of course and speed changes. Even though some of the communications circuits were down, this still could have been accomplished via the bridge to bridge radio.
 3. LG didn't ask TR what her intentions were when she noticed TR changing course and speed erratically.
 4. LG didn't properly monitor the range to TR. She was supposed to maintain a 4,000-yard distance. When the range continued to close, LG's watch team didn't react soon enough to avoid the collision. Closer monitoring of the range and a quicker reaction to alter course and haul out of formation could have prevented the accident.
 5. The CO of TR was not fully aware of what was going on that night. He was not aware of the plan to conduct zigzag maneuvers or the fact that the LG was being brought in to the plane guard position.
- D. Discuss the authority and responsibility of the Commanding Officer and the roles of the OOD and CIC watchstanders, including:
1. The Commanding Officer is completely and inescapably responsible for the safety of the ship, regardless of whether or not he/she is to blame.
 2. The watch team on both ships failed to communicate with each other and bear the majority of the blame for the collision. Had TR's watch team kept LG informed or had LG's watch team asked TR what they were doing, proper action could have been taken in time to avoid the accident.

VI. Assignment Recommendations:

- A. Have students write a brief essay on the individuals they feel are most responsible for the accident.

- B. Assign students roles in the collision (i.e., CO, OOD, JOOD, TAO of the LG or CO, OOD, CICWO of the TR). Have them prepare papers defining their roles in the casualty and how much responsibility they have for the collision.
- C. Have students assess either on paper or in discussion form what steps could have been taken prior to the collision to prevent it, for example:
 - 1. Better training of the watchstanders
 - 2. Communication between the ships
 - 3. Communication between watchstanders on a single ship
 - 4. Prior planning and notification of the CO
- D. Select a student to represent each of the key players in the collision in a Naval Investigation. Have non-assigned students play the investigative role, asking questions and cross-examining after key players provide their initial statements.

Expect the Unexpected

by CDR Kevin Nicholas
Naval Safety Center

The seas are dead calm, and visibility is unrestricted as a CVN and a CG participate in a pre-deployment exercise. With a setting like this, you might wonder how these two ships could collide. Equally unbelievable is the fact no one was injured in this mishap, even though it cost more than \$10 million to repair the damage done to both ships.

What went wrong? The carrier's OOD had been qualified for seven months and was the most experienced OOD on board. When he assumed the watch at 2345, the CVN had tactical control of the CG and was proceeding to a new operating area. Before assuming the watch, he had reviewed the night orders and noted that the only scheduled event was an engineering-drill set at 0200.

Meanwhile, the cruiser's OOD, who had been qualified for one month, was standing his first night watch as OOD in the vicinity of a carrier. He knew from his turnover briefing that his ship was expected to operate close to the carrier during the upcoming watch.

Shortly after midnight, the CVN's tactical action officer (TAO) told the OOD to commence a zigzag submarine-avoidance plan. It was about 0100, however, before the carrier's OOD notified his counterpart on board the CG of this unscheduled event.

About 0030, the carrier's TAO briefed his CO on a plan to reposition the cruiser. This repositioning was necessary to support the completion of an ongoing electromagnetic interference (EMI) test plan. The CO approved this plan, and then went to his cabin. When the TAO informed the OOD of this unscheduled event, the latter sent a tactical signal to reposition the CG directly astern at two miles.

The cruiser's OOD began maneuvering the ship to station, and then called his CO and XO. Shortly thereafter, both arrived on the bridge to monitor this event.

At 0100, the carrier's TAO told the OOD that a series of electrical-load shifts had to be done to prepare for a switchgear fire drill scheduled for 0700. The TAO said there would be power interruptions to some communications equipment and radars for a short time. Because this was an unscheduled event, the OOD directed the TAO to get the CO's permission before starting the event.

A little later, the CVN's aircraft-maintenance shop requested permission from the OOD to test a jet engine on the fantail. The OOD gave permission for this routine event and ordered the aft

lookouts to shift to their alternate stations on the ship's quarters. This move ensured their safety but made it impossible for them to see what was happening astern the ship.

About 0130, power interruptions to the CVN's primary tactical circuit, bridge-to-bridge radio, and surface radars began. However, the OOD didn't advise his CO of this situation. He used only flashing light to communicate with the CG, which meant the latter wasn't getting complete details. *(Note: Full power to the communications equipment and radars wasn't restored until after the collision.)*

With the CG still on station supporting the EMI testing, the carrier's OOD allowed the scheduled engineering drills to start. He didn't advise the CO of a potential conflict between the two events. His only warning to the CG was a flashing-light message, stating that speed changes could be expected because of engineering drills. The CVN then executed a maneuvering transient (planned series of ahead and astern bells) to start the drill package. At 0219, all ahead flank was ordered.

During the next 34 minutes, the CG fell in and out of station, trying to maintain position as the CVN executed several speed changes. At no point, though, did the cruiser's OOD question his counterpart on the CVN about the unsignaled movements.

Nine minutes before the collision, the CVN executed an all-back-full bell. At the same time, the CG set flight quarters to recover their helicopter. This event meant that the cruiser's primary watch stander who was supposed to monitor range to the CVN had to move from his post on the bridge. He had to assume his new duty as a phone talker. Also, the CO was absent from the cruiser's bridge. He earlier had gone to CIC to monitor the EMI testing and had left the XO to oversee the bridge.

Two minutes before the collision, the CG commenced a slow turn to starboard to attain satisfactory winds for recovering the helicopter. At that point, neither ship recognized that the amount of relative movement between the two was leading to disaster.

With a closure rate of 700 yards per minute, a collision was imminent. One minute before impact, the cruiser's OOD ordered back full, and his counterpart ordered ahead flank. These orders, however, only reduced the relative motion of impact. The cruiser's CO arrived on the bridge just before the collision. The carrier's CO arrived on his bridge just afterwards, following a call from the OOD.

Damage to the port bow forced the CG to return to port immediately. The CVN, however, completed the exercise, then returned to port for extensive repairs to her stern.

To avoid such mishaps, watch officers must keep the basic rules of seamanship in mind and obey doctrine. Nautical rules of the road in Coast Guard ComdtInst 16672.2B and station-keeping procedures of ATP 1 were written in blood. Careful thought went into developing these procedures. Give equally careful consideration to the consequences when you deviate from them. COs must ensure their watch officers are trained to seek guidance before straying from any approved procedure or plan.

The CO and his direct representative, the OOD, must be informed of every event that affects the safe operation of a ship. COs must ensure they have an organization that supports the detailed planning of day-to-day operations and that the plan is briefed to those who must carry it out. Every watch officer must guard against ad hoc changes. If any deviations are made to the original plan, give them the same careful review and approval.

Watch organizations must be trained to support the ship's missions. Watch standers must understand how their duties fit into the overall operation and what safety-of-ship responsibilities their actions carry. They also must realize the vital backup they provide during complex operations. Encourage watch standers to make recommendations and point out problems. They then will know the value of their jobs and will speak up when something isn't right.

Carefully consider the experience level of key watch standers. Completing qualification requirements for a watch station does not automatically give people the experience to deal with every situation. Know when to look over a watch stander's shoulder and provide mature guidance. Provide a balance of experience in watch sections. Pair a less-experienced OOD with the best TAO. Strive for balanced experience across watch sections.

As part of the planning process, use operational risk management (ORM) to assess the risk of an event. ORM helps identify hazards facing a watch section. It provides insight into the controls necessary to ensure safe operations. It provides trip wires or thresholds that watch standers can recognize and act on when exceeded. For example, establish a minimum ship separation of 2,500 yards. Immediately turn away when this threshold is reached. This action could have been a planned response to reduce the risk of operating 4,000 yards directly astern of a ship at night with an inexperienced bridge team.

As published in "Fathom," Oct-Nov 97. The author may be contacted at e-mail: knichola@safecen.navy.mil.

**Your Worst Nightmare: The Terror, Trauma and Fallout
of a Collision at Sea**
by Ernest Blazar

It's every sailor's nightmare. A collision alarm blasts non-stop through the red-lit darkness of a warship's passageways at night. On the bridge, the urgency of an order conveys this is not drill. "All back full!" The voice repeats with ever-growing intensity, "BACK EMERGENCY FULL!"

Scared and startled, sailors tumble from their racks, awakened by the alarm. Watch teams in the combat center wonder what the hell is happening. On the bridge, desperate men try in vain to avoid disaster. They try to keep their cool and maintain their bearing as all hell breaks loose around them.

At 2:52 a.m., Oct. 14, 1996, under a dark and moonless sky, the officers and crew of the guided missile cruiser *Leyte Gulf* watched helplessly when, without warning, the 92,000-ton aircraft carrier *Theodore Roosevelt* backed directly down onto them at a speed of 13 knots.

They did what they could, as soon as they could. But investigators found later it was too little, too late.

In the seconds before the crash -- a seeming eternity -- the huge carrier's stern loomed larger and larger in the cruiser's bridge window. The bridge crew realized too late that the carrier was steaming in reverse. Their 9,000-ton cruiser trembled in protest as its propellers switched pitch, desperately trying to bite backward into the sea to reverse the ship's forward momentum and gain "bail out speed" from the carrier's path.

As their collective minds grinded the mental math of how the two ships could avoid collision, the inevitable conclusion dropped on the men in the bridge like an anchor chain. They weren't going to make it. "ALL HANDS BRACE FOR SHOCK!" squawked the 1MC. "Oh, my God!" screamed the starboard bridge wing lookout. "We're going to hit the carrier!"

Even as horror replaced disbelief, there was heroism. Seconds before impact, Capt. Coleman A. Landers, *Leyte Gulf*'s skipper, darted from the bridge to yank the port bridge wing lookout inside to safety. And then the nightmare announced its arrival in a scream of metal, as the two ships came together at a collective speed of 20 knots.

The impact knocked cruiser sailors off their feet. They slid and piled together -- some legs in the air, some dangling overboard -- as the cruiser heeled 20, 30, then 40 degrees to starboard.

Electric power was lost on the bridge and darkness descended on

the mayhem. Over the long, grinding screech of ship's steel on ship's steel, a lone, panicked sailor's yell rose above the others. "We're sinking! We're sinking!"

Looking back

Only luck, fate, and the strength of well-built ships ensured no sailors died that night. But the nightmare wasn't without cost.

- Two well-liked and respected skippers were found guilty at mast for dereliction of duty and improperly hazarding a vessel. Landers was removed from command Nov. 13. And while Capt. Ronald L. Christenson, the T.R. skipper in his final days before change of command, rotated off the Roosevelt as planned, his promotion to rear admiral -- effective weeks before the crash -- is now at risk.
- A promising future commanding officer won't get a chance to command. Lt. Cmdr. Jose A. Vazquez, the executive officer aboard Leyte Gulf, had screened for command of his own ship before the accident. But he was found guilty at mast of dereliction of duty and negligently hazarding a vessel. Now he's unlikely to ever be a skipper.
- Damage to both ships was significant, costing the Navy a combined \$10 million to repair.

Reviewing the accident immediately after the incident, Second Fleet Commander Vice Adm. Vernon Clark gave all three officers punitive letters of reprimand.

Now, in the final accident report on the crash, Atlantic Fleet Commander-in-Chief Adm. J. Paul Reason has gone a step further. In the final endorsement to an exhaustive report, Reason placed most of the blame for the crash on Christenson's shoulders.

"The collision was caused by USS Theodore Roosevelt backing into Leyte Gulf without warning," Reason concluded in the 550-page report, released by the Navy April 7 in response to Freedom of Information Act requests.

He said Roosevelt's decision to maneuver backward while some radios were down was "inherently incompatible" and that aboard Roosevelt "there was no effective organizational mechanism for deconflicting events."

The exhaustive report chronicles hundreds of eyewitness accounts, log records and personal interviews and shows how a string of bad or missed messages and poor judgment between Leyte Gulf and Roosevelt conspired to cause what many sailors consider the ultimate nightmare. It also shows -- in clear and stark fashion

-- the Navy's longstanding tradition of command responsibility. Along with total authority, the tradition contends, comes complete responsibility. And accountability.

Commander's intent

The weather and the sea were calm. There was so little moonlight that, from Leyte Gulf's bridge, executive officer Lt. Cmdr. Jose A. Vazquez could see no horizon.

Like many times in the past two months of predeployment training, Leyte Gulf steamed 4,000 yards behind the Roosevelt, taking its turn on "plane guard," keeping close behind the carrier so it could help rescue fliers in case a plane crashed during takeoff or landing.

On this night, Roosevelt had stopped flying her planes for the evening but the two were staying close to test how Leyte Gulf's Aegis radar might affect -- or interfere with -- a new communications system called Challenge Athena, recently installed on Roosevelt. The test was to determine how much EMI, or electromagnetic interference, Aegis generated, and how badly it affected the Challenge Athena gear.

With the test scheduled to begin at 0230 the morning of Oct. 14th, both ships marked the passing of midnight with the changing of the watch.

Busy midwatch schedule

Officers and sailors on both ships relieved one another after checking message boards and reading the orders and plans for a busy midwatch. A number of drills and tests were planned, any of which would have been routine if done in isolation. But done all together, the accident investigation board concluded, they mixed for a dangerous, and possibly deadly, combination.

Among Roosevelt's drills planned for that night were:

- Zig-zag maneuvers. To practice how to avoid enemy submarines, Roosevelt was cutting a zig-zag course through the Atlantic. Christenson was not informed of this plan, although subordinates thought he was. Nor was he told Leyte Gulf would be brought close behind Roosevelt for the EMI test that night. "That was not my intent," Christenson later told investigators.
- Propulsion plant drills. To ready herself for an upcoming pre-deployment safety check of her nuclear-powered engines, Roosevelt's engineers won approval from their skipper to put

the engines through a series of forward-backward maneuvers, throwing them from 34 knots forward to 17 knots in reverse in seconds.

- Power shifts. To prepare for a different nuclear engine drill later that morning, engineers switched energy sources for some of its primary equipment to "alternate" sources in what is called a "manual bus transfer." The change had the side effect of shutting down many of T.R.'s radars and radio gear, systems the ship relied on to see and talk with other ships nearby.

Aboard Leyte Gulf, a ship one-tenth the carrier's size of T.R., no one was aware of the carrier's plans that night. T.R. failed to alert Leyte Gulf that its communications systems would be down, that it would be running its engines in reverse or that it would be zig-zagging through the ocean, investigators determined. But Leyte Gulf's bridge team also failed to query the Roosevelt in a timely fashion when it became obvious that they were ill-informed of the carrier's operating plans. In the end, investigators blamed both ships.

Disaster looms

At about 12:20 a.m., Roosevelt's electricians and engineers start shifting power throughout the carrier to ready the ship for a propulsion exercise at 7 a.m. The move, they have told their shipmates, will knock out some radars and radios aboard ship, but only for about 10 minutes. They are wrong. Instead, the power disruption's after-effects will last more than an hour and contribute significantly to the impending collision, officials will later determine.

But other radio links between Roosevelt and Leyte Gulf remain open. Indeed, one message will pass from Roosevelt to Leyte Gulf only five minutes before the collision. Inexplicably, however, this link is not normally used to discuss ships' movements, and is not used for that purpose on this night either.

Instead of these message links, Roosevelt's officer of the deck reverts to the old-fashioned system: He sends Leyte Gulf three flashing light signals announcing:

- Changes in the zig-zag course.
- T.R.'s problems with its radio circuits.
- And finally a warning that the cruiser should stay ready for "course and speed changes."

But Leyte Gulf's signalmen are not prepared. Instead of decoding the messages instantly, it will take Leyte Gulf 28 minutes to receive and understand the final message, sent at 2:10 a.m., advising of course and speed changes. The delay, the result of poor signaling skills aboard Leyte Gulf, investigators said, meant Leyte Gulf's bridge team was denied precious information at a critical time.

Now, at 2:18 a.m., Roosevelt begins its course and speed changes. According to a schedule called "maneuvering transient number two," the massive carrier switched rapidly between full speed ahead and full speed reverse, along with several intermediate speeds each way in between.

What's Roosevelt doing?

Aboard Leyte Gulf, Landers and Vazquez are trying to keep their normal station, 4,000 yards astern of the carrier, and having more trouble than usual. At times, Roosevelt unexpectedly leaps ahead, opening the gap between the two ships to as much as 5,500 yards, and leaving Leyte Gulf struggling to keep up.

Landers leaves the bridge at 2:24 a.m., and heads for the ship's combat information center to prepare for the planned EMI test, which will involve firing up the Aegis radar. Vazquez, who Landers would later fiercely defend during the investigation, remains on the bridge with the officer of the deck and the other watchstanders.

At 2:44 a.m., Roosevelt officers order the ship into "back full emergency" for a six-minute propulsion test. The ship, then steaming forward at 7 knots, slows, stops and reaches a maximum backward speed of 16 knots, all the while heading directly toward Leyte Gulf. The 3,600-yard distance between the ships is cut in half. At the same time, Vazquez and his bridge team focus their efforts on recovering a helicopter, "Proud Warrior 434," the ships' SH-60 Seahawk. The helo had been on routine flight operations and was returning to land. At 2:50 a.m., Vazquez calls Landers in CIC for instruction. Landers advises that he reverse the ship's course away from Roosevelt to recover the helo, but issues no orders for speed changes.

A minute later, as flight quarters are sounded, Vazquez wants to increase the ship's speed from 2 knots for a safer helicopter recovery. Increasing speed further closes the distance between the ships. Vazquez orders the helmsman to turn the ship "right full rudder," but at Leyte Gulf's slow speed, the move has little effect on her direction. Vazquez orders the engine speed "to two-thirds and standard" to help the ship make the turn, bringing the ship up to 6 knots. Now the gap between the two ships is 1,700 yards and closing, at a combined speed of 20 knots.

Vazquez would later tell investigators: "At this very same time, sir, right as I looked up at 6 knots, the very next thing that I did was, I looked across the aircraft carrier and she was -- it's -- she was not where she should have been based on the information I had."

Now the ships are only about 1,000 yards apart, and Roosevelt is closing in, fast. "Back emergency full!" Vazquez barks. He calls Landers to the bridge.

"We were...driven down"

"I slammed off the earphones, ran out, ran into one of my guys . . . and cleared the three flights to the bridge," Landers told Rear Adm. Michael Mullen, the chief investigator for the report.

"And as I opened the door to the bridge, all I see was the flight deck of the carrier. Close. Very close."

Landers has less than 20 seconds to act. Grabbing the ship's throttle to make sure it was all the way back, he calls for five short blasts to warn Roosevelt, and sounds his own ship's collision alarm. Though Landers said he didn't remember it, several sailors saw him lunge through the hatch to the port bridge-wing and yank to safety the sailor on look-out.

And then it happened. The nightmare was upon them.

The signalman watch supervisor on the Leyte Gulf told investigators of the horrifying moment just prior to impact.

"I overheard the starboard lookout screaming, 'Oh my God, we're going to hit the carrier,'" he said. "As the carrier's flight deck lights loomed closer and closer, our ship's whistle began to sound. For a fraction of a second, I remember thinking, 'We're going to make it.'"

But they didn't. The sailor said he dove into the signal shelter for cover.

As the warships collided, Leyte Gulf took a mighty, twisting, starboard roll. Some say it tipped more than 40 degrees. Her bow rammed into the stern of the carrier, rode up slightly, then twisted to starboard as the Roosevelt continued a backward drive.

The Leyte Gulf spun around hard. "It felt as if we were being driven down," one officer on the Leyte Gulf recalled.

As the Roosevelt rammed and then pushed by with sheer momentum and force, the two ships finally separated. Leyte Gulf spun around 270 degrees starting to go in reverse as a result of the

last change to the throttle seconds before the crash. A sailor on the cruiser's flight deck felt it firsthand.

"There was a loud 'Boom' and I fell against the lifelines and hit the deck," he told investigators. "The ship started listing to starboard and my leg was over the side. That's when I knew I had to get into the quarterdeck before I went over the side. I managed to scramble on all fours to the quarterdeck and away from the water. When the ship had settled, I walked outside and looked off the starboard bow and saw the carrier."

Though not as dramatically, sailors on the Roosevelt felt the crash, too. "The ship rocked and rolled as though something had hit us," one sailor testified.

In the end, no one was seriously injured in the collision. The ships were repaired and deployed on schedule. Only the careers of a few officers were irreparably harmed.

Leyte Gulf's Boatswains' Mate of the Watch described the entire event for investigators, the last moments of impending disaster, the crash, the screams and yells that followed. Then, when he was done, and they had finished asking questions, he said, "There's one more thing I'd like to say, sir. Can I say one more thing?"

"Sure," said Rear Adm. Mullen.

"If I was to get underway tomorrow on this ship," the sailor said, "I'd want the same CO, the same XO, and the same bridge team."

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**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 13

HOURS: 1

TITLE: Shiphandling (Forces/Tugs/Equipment)

I. Learning Objectives

- A. The student will comprehend the effects of controllable and non-controllable forces.
- B. The student will know the various conning orders and maneuvering terms.
- C. The student will comprehend the different handling characteristics of single and twin screw ships.
- D. The student will know tug handling procedures in restricted maneuvering situations.
- E. The student will demonstrate the techniques for using binoculars, stadimeter, radar, and bearing circles when involved in ship handling situations.

II. References and Texts

A. Instructor references

- 1. Seamanship: Fundamentals for the Deck Officer, pp. 98-109, 150-169
- 2. Surface Ship Operations, NAVEDTRA 12973, pp. 1-1 through 1-10; 2-1 through 2-19
- 3. Naval Shiphandling, pp. 13-59 (optional)
- 4. Knight's Modern Seamanship, pp. 123-143, 241-305 (optional)
- 5. "Organizational Structure" Handout (attached after Lesson 11)
- 6. "Officer of the Deck Study Guide" (attached after Lesson 11)
- 7. Naval Shiphandler's Guide, Chapters 6 and 8

B. Student texts

- 1. Seamanship: Fundamentals for the Deck Officer, pp. 98-109, 150-169

2. Surface Ship Operations, NAVEDTRA 12973, pp. 1-1 through 1-10; 2-1 through 2-19
3. "Organizational Structure" Handout (attached after Lesson 11)
4. "Officer of the Deck Study Guide" (attached after Lesson 11)

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Instructor should prepare a handout on standard commands, commands to linehandlers, anchoring terminology, and man-overboard recovery techniques or use the attached "Officer of the Deck Study Guide."
- C. Computer-aided software: Navigation Simulator (optional)
- D. Computer (optional)
- E. Projection pad (optional)

IV. Suggested Methods and Procedures

- A. Method options
 1. Units with access to operational ship trainers should add a lesson devoted to practicing shiphandling, using proper rudder and engine commands.
 2. All other units are encouraged to separate their students into groups of 4-6 students in an additional lesson to simulate bridge-watch teams utilizing the Navigation Simulator software. Simulate numerous evolutions (i.e., man-overboard drills). Plan in advance to make this an interesting and beneficial lesson.
 3. Handout/Review: For use with Lesson 11, instructor should distribute the attached "Officer of the Deck" handout discussing watch standing, turnover, and engine orders or provide an instructor-prepared handout. (**NOTE:** The review sheet may also be useful to midshipmen preparing to go on first-class cruise, since it incorporates a review of engine and rudder orders, watch turnover procedures, terminology, and other useful

information for OODs.)

B. Procedural and student activity options

1. Lecture/Class discussion
2. In-class standard command practical exercise

V. Presentation

A. Discuss the following controllable forces involved in shiphandling:

1. Engine(s). (Include a brief discussion of bow thrusters/APUs.)
2. Propeller(s). (Include differences between single and twin screw ships.)
 - a. CRP -- zero thrust
 - b. Sternwalk -- result of torque
3. Rudder -- controlling the stern
4. Lines
5. Anchors
6. Tugs and their use in restricted maneuvering situations

B. Discuss the following uncontrollable forces involved in shiphandling:

1. Wind
2. Currents/Tides
3. Depth of water

C. Define the following terms and discuss when they are used:

1. Turning circle
2. Advance
3. Transfer
4. Tactical diameter

5. Pivot point
 6. "Turn on the knuckle"
 7. "Kick the stern-out"
 8. Sternway
 9. Headway
 10. Bare steerageway
 11. Propeller wash
- D. Discuss standard rudder and engine terminology and commands.
- E. Discuss the procedures, safety precautions, and standard terminology in giving rudder, engine, and line-handling commands when:
1. Getting underway
 2. Mooring to a buoy and alongside a pier
 3. Anchoring
 4. Recovering an overboard person
 - a. Williamson
 - b. Anderson
 - c. Racetrack
- F. Discuss and have the students demonstrate the use of:
1. Binoculars
 2. Stadimeter
 3. Radar
 4. Bearing circles

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 14

HOURS: 1

TITLE: Intended Track and Current Sailing

I. Learning Objectives

- A. The student will comprehend the terminology associated with a vessel's actual and intended track.
- B. The student will apply correct procedures in the use of the estimated current triangle to determine the expected track and speed of advance in a given current and to determine the course and speed that should be ordered to proceed along an intended track in a given current.
- C. The student will apply correct procedures to determine an estimated position, given ship's ordered course and speed and an estimated current.
- D. The student will apply correct procedures in the use of the actual current triangle to determine the set and drift of an actual current experienced.

II. References and Texts

- A. Instructor references
 - 1. Marine Navigation, Chapter 13
 - 2. Dutton's Nautical Navigation, Chapter 13
 - 3. Marine Navigation Workbook
- B. Student texts
 - 1. Marine Navigation, Chapter 13, pp. 143-144
 - 2. Marine Navigation Workbook

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Computer/projection system and PowerPoint slides or overhead projector and locally-prepared transparencies
- C. Position plotting sheet (PPS)

- D. Plotting instruments
 - E. Wall-mounted maneuvering board or maneuvering board transparency
 - F. Large chalkboard and parallel rulers
- IV. Suggested Methods and Procedures
- A. Method options
 - 1. Lecture
 - 2. Demonstrate plotting and labeling techniques
 - B. Procedural and student activity options
 - 1. Complete assigned reading
 - 2. Complete assigned workbook exercises
- V. Presentation
- A. Define and illustrate basic terminology
 - 1. Speed of advance (SOA)
 - 2. Track (TR)
 - 3. Course over ground (COG)
 - 4. Speed over ground (SOG)
 - 5. Set and drift
 - 6. Position of intended movement (PIM)
 - 7. Ship's Movement Report (MOVREP)
 - B. Explain and illustrate the estimated current triangle as a vector diagram.
 - C. Show how to determine actual set and drift by comparison of fix and DR positions using a DR plot from a previous exercise.
 - D. Show how to use estimated set and drift.
 - 1. Determine intended TR and SOA based on an ordered course and speed.
 - 2. Determine the course needed to make good an

intended track and SOA.

3. Determine the course and speed needed to arrive at a destination at a particular time.
- E. Explain how set and drift are used to determine and plot an estimated position (EP).
- F. Explain and illustrate the actual current triangle and its relationship to the estimated current triangle.
- G. Discuss the usage of the PIM in Navy voyage planning and MOVREPS.
- H. Assign a practice exercise.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 15

HOURS: 1

TITLE: Anchoring

I. Learning Objectives

- A. The student will know the terminology used to describe a naval ship's tactical characteristics in reference to anchoring.
- B. The student will apply proper procedures in the use of advance and transfer to determine turn bearings during anchoring.
- C. The student will apply correct procedures in setting up the approach plot for anchoring.
- D. The student will know the terminology associated with precision anchoring.

II. References and Texts

A. Instructor references

- 1. Marine Navigation, Hobbs, Chapter 14
- 2. Dutton's Nautical Navigation, Chapter 14
- 3. American Practical Navigator, Chapter 8
- 4. Marine Navigation Workbook
- 5. Naval Shiphandler's Guide, Chapter 6

B. Student texts

- 1. Marine Navigation, Chapter 14
- 2. Marine Navigation Workbook

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Chart (select a small area, large scale harbor chart)
- C. Plotting instruments

- D. Computer/projection system and PowerPoint slides or overhead projector and locally-prepared transparencies
- E. Large chalkboard compass and parallel rulers
- F. Laboratory 5

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Lecture
 - 2. Demonstration of plotting techniques
- B. Procedural and student activity options
 - 1. Complete assigned reading
 - 2. Complete assigned workbook exercises

V. Presentation

- A. Review and define the terminology used in describing shiphandling characteristics.
 - 1. Advance and transfer
 - 2. Angle of turn
- B. Discuss the importance of environmental and geographic factors in selecting a desirable anchorage.
- C. Explain how shiphandling characteristics vary from ship to ship and with speed and angle of turn when anchoring.
- D. Explain the application of advance and transfer in anchoring.
- F. Lay out an approach track to an anchorage and explain the sequence of events for the ship control and navigation teams, as well as the anchor detail. Define and explain:
 - 1. Head bearing
 - 2. Drop bearing
 - 3. Letting-go circle
- G. Briefly explain post-anchorage procedures and

terminology.

H. Assign a practical exercise.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LABORATORY: 5

HOURS: 1

TITLE: Precise Anchoring

Reference: Lesson Number 15

I. Learning Objectives

- A. The student will comprehend the use of the ship's tactical data folder during precision piloting and anchoring.
- B. The student will apply correct procedures in setting up the approach plot for anchoring.

II. Instructional Aids

- A. DMATHC chart 12254 (or alternate with plotted anchorages) or chart 18773 for Sample Lab 5
- B. Plotting instruments
- C. Acceleration/Deceleration table
- D. Advance/Transfer table
- E. Sample Lab 5 script (or alternate exercise prepared by instructor)

III. Instructor Preparation

- A. Select a starting point for entrance to harbor.
- B. Assign the initial course/speed.
- C. Assign an anchorage and time of arrival.
- D. Prepare a script (or use Sample Lab 5 script provided) with any additional information (wind, current, etc.).

IV. Presentation

- A. Distribute chart and script.
- B. *Using the advance/transfer and acceleration/deceleration tables, students should lay out intended track and turn bearing and the complete anchorage plot to include head bearings, letting-go circle, letting-go bearing, range circles, and drag circle.*

SAMPLE

LAB 5 Anchoring

Score _____

Name _____
Chart 18773

I. A. PLOT THE FOLLOWING POINTS ON THE CHART: (2 POINTS)

POINT A 32° 39' 50" N
 117° 12' 09" W

POINT B 32° 40' 00" N
 117° 11' 00" W

B. YOU ARE THE NAVIGATOR OF THE *USS PORTER (DDG-78)*. YOU JUST RECEIVED WORD THAT YOU WILL BE ANCHORING AT **POINT B** TOMORROW AFTERNOON. PREPARE AN ANCHORAGE PLOT FOR THE EVOLUTION. YOU WILL APPROACH **POINT A** FROM DUE SOUTH ON COURSE 000°T, SPEED 10 KNOTS. AS YOU APPROACH **POINT B**, USE THE TOWER ON SILVER STRAND FOR YOUR HEAD BEARING. (PARTS B THROUGH G WORTH 25 POINTS)

IMPORTANT DATA:

DISTANCE FROM HAWESPIPE TO PELORUS = 150 FT
LENGTH OF SHIP (USS PORTER) = 512 FT
LENGTH OF ANCHOR CHAIN = 250 FT
1 YARD = 3 FEET

ADVANCE AND TRANSFER TABLE

Turn Angle	Advance (yards)	Transfer (yards)	Turn Angle	Advance (yards)	Transfer (yards)
15	500	38	105	993	853
30	680	100	120	933	1,013
45	827	207	135	827	1,140
60	940	347	150	687	1,247
75	1,007	513	165	533	1,413
90	1,020	687	180	367	1,500

II. A. CALCULATE THE ADVANCE AND TRANSFER FOR THE TURN AT **POINT A** USING THE TABLE BELOW.

ADVANCE _____ TRANSFER _____

- B. PLOT THE ADVANCE AND TRANSFER FOR THE TURN AT **POINT A** ON THE CHART. USE THE "HORN" LIGHT OFF YOUR PORT BOW TO PLOT THE TURN BEARING.
- C. PLOT THE REST OF THE REQUIRED DATA FOR THE ANCHORAGE ON THE CHART, INCLUDING RANGE CIRCLES, LGB, HB, ETC. USE THE "SOUTH TOWER CORONADO HOTEL" TO PLOT THE LETTING GO BEARING.

RADIUS OF THE LETTING GO BEARING _____

- D. **TIME WARP.** ASSUME THE ANCHOR WAS DROPPED AT THE CENTER OF THE ANCHORAGE POINT. CALCULATE, PLOT AND LABEL THE SWING CIRCLE AND DRAG CIRCLE.

RADIUS OF SWING CIRCLE _____

RADIUS OF DRAG CIRCLE _____

- E. MISSION COMPLETE.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 16

HOURS: 1

TITLE: Maneuvering Board - Wind

I. Learning Objectives

- A. The student will apply the speed triangle to determine direction and velocity of true and relative wind.
- B. The student will know the effect of true and relative wind on ship operations.

II. References and Texts

A. Instructor references

- 1. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 14-1 through 14-6
- 3. Naval Shiphandler's Guide, Chapter 11

B. Student text:

- 1. Radar Navigation and Maneuvering Board Manual, PUB 1310 (Instructor Handouts)
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 14-1 through 14-6

III. Instructional Aids

- A. Training Device 6605-00-240-5717: Wall-mounted maneuvering board
- B. Large parallel rulers (chalkboard)
- C. Large dividers 18" (chalkboard)
- D. PowerPoint slide or transparency of maneuvering board
- E. Computer/projection system or overhead projector
- F. Chalkboard/whiteboard

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Lecture
 - 2. Problem-solving demonstration
 - B. Procedural and student activity options
 - 1. Work practical wind problems in class.
 - 2. Assign homework.
- V. Presentation
- A. Define the following:
 - 1. True wind
 - 2. Relative wind
 - 3. Apparent wind
 - B. Demonstrate solving for true wind.
 - 1. Explain that apparent wind is the true direction of the relative wind. The force of apparent wind and true wind are always the same.
 - 2. Relate the similarities between the speed triangle and the wind triangle.
 - a. True (ownship) still at center
 - b. ER - true course and speed of ownship
 - c. Still using triangle to solve for relative motion (in this case, relative motion of wind).
 - C. Discuss solving for course and speed in order to obtain a desired wind (i.e., flight ops).
 - 1. One process - rotating triangle - is covered in the Maneuvering Board Workbook.
 - 2. The second method - dot method - is described below. True wind direction and force must be known or calculated for this method.
 - a. Determine true wind, if not given. Draw a line across the maneuvering board, beginning

at the bearing from which the true wind is blowing, through the center, to the reciprocal bearing.

- b. On the edge of the maneuvering board, on the end of the true wind at the bearing reciprocal to that from which the true wind is blowing, draw a triangle. Label the port and starboard sides of this symbol with the appropriate P and S.
- c. Determine "Dot 1". This represents the desired wind and is determined in two steps.
 - (1) First, from your ship symbol count over the number of degrees in the correct direction that the desired wind should be off the bow. In this case, you count over 10 degrees on the "P" side of your ship symbol, or the 330 bearing mark.
 - (2) The second step is to place your dot along this bearing on the ring associated with the desired speed (force). Finally, label this point "1".
- d. Determine the "Dot 2's". Using the same scale that was used to measure the desired wind force, we open our compass to the true wind force.
 - (1) From "Dot 1," we mark off an arc that intersects the true wind line in, at most, 2 points.
 - (2) If the circle centered at "Dot 1" with radius of the true wind force does not intersect the true wind line, then no course and speed will yield the desired wind.
 - (3) Label these intersection points "2".
- e. To find the course to steer, we connect the dots, from 1 to 2. The high-speed course will come from the "Dot 2" furthest from the center. Parallel this direction to the center to find the course to steer for the high-speed solution. The course for the low-speed solution is obtained in a similar way by connecting "Dot 1" to the "Dot 2" that is closer to the center.

- f. The speeds are found by measuring the distance from the center to the corresponding "Dot 2". The measure from the center to the furthest "Dot 2" is the high-speed solution. The measure from the center to the closest "Dot 2" is the low-speed solution.
 - (1) Note that the ship may not be able to go as fast as the high-speed solution requires; therefore, the only feasible solution may be the low-speed one.
 - (2) If the low-speed "Dot 2" is on the far side of the center from "Dot 1," then the true wind force is too great to steer into the wind to achieve the desired wind. In this case, the only feasible solution may be to "run with the wind."
- D. Explain the following helpful hints regarding wind problems:
 - 1. Relative and true wind are always on the same side of the ship.
 - 2. True wind is always from a direction aft of relative wind when the ship has headway.
 - 3. The faster the ship travels, the closer relative wind approaches the bow.
 - 4. In any discussion of direction of the wind, true, relative, or apparent direction means the bearing from which the wind is blowing -- not the direction to which it is blowing.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LABORATORY: 6

HOURS: 1.5

TITLE: Wind

I. Learning Objectives

- A. The student will apply the speed triangle to determine direction and velocity of true and relative wind.
- B. The student will know the effect of true and relative wind on ship operations.

II. References and Texts

A. Instructor references

- 1. Radar Navigation and Maneuvering Board Manual, PUB 1310
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 14-1 through 14-6
- 3. Naval Shiphandler's Guide, Chapter 11

B. Student text:

- 1. Radar Navigation and Maneuvering Board Manual, PUB 1310 (Instructor Handouts)
- 2. Maneuvering Board Workbook, NAVPERS 93440-A, pp. 14-1 through 14-6

III. Instructional Aids

- A. Training Device 6605-00-240-5717: Wall-mounted maneuvering board
- B. Large parallel rulers (chalkboard)
- C. Large dividers 18" (chalkboard)
- D. PowerPoint slide or transparency of maneuvering board
- E. Computer/projection system or overhead projector
- F. Chalkboard/whiteboard

IV. Suggested Methods and Procedures

- A. Conduct problems 14.10 through 14.16.
- B. Ensure the students understand the difference between desired wind and true wind.
- C. Ensure the students understand the difference between stationing maneuvering board problems and wind maneuvering board problems.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 17

HOURS: 1

TITLE: Evolutions - Underway Replenishment

I. Learning Objectives

- A. The student will know the types of ships involved in underway replenishment.
- B. The student will know basic UNREP procedures, from coming alongside to breaking away.
- C. The student will know basic UNREP communication procedures.
- D. The student will know the equipment associated with replenishment at sea.
- E. The student will know UNREP safety precautions.

II. References and Texts

A. Instructor references

- 1. Seamanship: Fundamentals for the Deck Officer, pp. 275-302
- 2. Naval Shiphandling, pp. 155-161, 291-293 (optional)
- 3. Knight's Modern Seamanship, pp. 10, 129, 149 (optional)
- 4. NWP 4.01.4, "Underway Replenishment" (optional)
- 5. "Underway Replenishment" Handout (attached)
- 6. Naval Shiphandler's Guide, Chapter 9

B. Student text:

- 1. Seamanship: Fundamentals for the Deck Officer, pp. 275-302
- 2. "Underway Replenishment" Handout (attached)

III. Instructional Aids

- A. Chalkboard/whiteboard

- B. Computer/projection system and PowerPoint slides or overhead projector and locally-prepared transparencies
- C. Video: "Basic Elements -- Replenishment at Sea," 30 minutes (optional)
- D. VCR/Monitor (optional)

IV. Suggested Methods and Procedures

A. Method options: Lecture/Discussion

1. Discuss the entire UNREP evolution, from arrival at lifeguard station, to coming alongside, and then to breakaway.
2. Emphasize safety procedures.
3. Show the video at the end of the class period.
4. Prepare transparencies from pp. 288-291 of Seamanship.
5. Distribute the attached handout that discusses underway replenishment procedures and terminology.

B. Procedural and student activity options: Conduct an Underway Replenishment Brief

1. Assign individual students or student groups some portion of an UNREP brief to present to the class. (One possible breakdown includes: approach, alongside operations, breakaway, safety and vertical replenishment.)
2. This method of instruction provides students with the opportunity to practice briefing, as well as allowing them to employ the commands, communication and other skills they have learned.

V. Presentation

- A. Discuss the different types of UNREP delivery ships.
- B. Discuss the steps involved in the UNREP evolution.
 1. Lifeguard station -- 1,000 yards astern
 2. Waiting station -- 300-500 yards astern
 3. UNREP course and speed

4. Approach course and speed
5. Shot line
6. Messenger and phone and distance line
7. Span wire -- tensioning
8. Engage/Hookup rig
9. Transfer of supplies and/or fuel
10. De-tension
11. Disengage
12. "All lines are clear"
13. Breakaway
14. Emergency breakaway

C. UNREP Communications

1. Flag Romeo -- closed-up, at-the-dip, and hauled-down
 - a. Receiving ship
 - b. Delivery ship
2. PREP -- closed-up, at-the-dip, and hauled-down
 - a. Receiving ship
 - b. Outboard halyard -- 15 minutes, 5 minutes, disengaging
3. Phone and distance line
4. G R Y B W G = go rub your back with grease =
go read your book with glasses =
green - red - yellow - blue - white - green
 - a. Sound-powered phone circuit
 - b. Bridge-to-bridge radiotelephone -- safety net
 - c. Semaphore
 - d. EMCON

- e. Hand and paddle signals
- D. Discuss the basic equipment associated with an UNREP.
 - 1. Inhaul
 - 2. Outhaul
 - 3. Messenger
 - 4. Shot line
 - 5. Span wire
 - 6. Fuel probe/Probe receiver
 - 7. Ram tensioner
 - 8. Burton rig
 - 9. Manila highline -- personnel transfer
 - 10. Boatswain's chair
 - 11. STREAM rig, traveling surf, and cargo drop reel
- E. UNREP safety
 - 1. Safety officers
 - a. Underway Replenishment Stations
 - b. Helm Safety Officers
 - c. Aftersteering Safety Officers
 - 2. Kapok life jackets
 - a. Chemlights
 - b. Whistle
 - 3. Helmets -- colors
 - 4. Line handling safety
 - a. Hand-over-hand
 - b. No watches, rings, jewelry, etc.
 - c. Safety knife

- d. Avoidance of the bight of the line
 - e. No metal or spark-producing objects
- 5. Safety shoes
- 6. Battle dress
- 7. Additional refueling watches
- 8. Smoking lamp extinguished
- 9. Emergency breakaway

Underway Replenishment

From the Enlisted Surface Warfare Guide (USS KITTY HAWK, 1997)

<http://www.fas.org/man/dod-101/navy/docs/esws.htm>

Terms:

- A. Replenishment course - A predetermined course that will permit ships to maintain course with a minimum of stress on rigs, etc. The course is determined by the delivery ship with considerations given to the mission of the strike group and the condition of the seas.
- B. Replenishment speed - Speed maintained during the actual UNREP operation. Generally between 12 and 16 knots. Determined by wind and sea conditions and set by the delivery ship.
- C. Control ship - Local guide for the underway replenishment and is responsible for maintaining a steady speed and course.
- D. Approach ship - Makes approach alongside the control ship and keeps station on the control ship.
- E. Delivery ship - Normally the control ship, provides lines, rigs, etc.
- F. Transfer station - A predesignated area aboard each ship where the rig is located and hooked up. Kitty Hawk's are located on the starboard side, with two fuel stations on the port side.
- G. Underway replenishment group (URG) - Comprised of ships to be unreppeped and delivery ships with OTC (Officer in Tactical Command) in charge.
- H. Receiving ship - Ordinarily the approach ship, receives lines, rigs, etc. from the delivery ship.
- I. Waiting station - An area approximately 2,000 yards aft of the delivery ship.
- J. Lifeguard station - 1,000 yards astern of the delivery ship and mans man overboard stations.
- K. Standby station - On your side of approach, 300 to 500 yards astern.

Equipment:

- A. Inhaul/Outhaul line - A line used to recover any piece of gear such as a trolley block. The vessel providing the gear retains the inhaul and sends the outhaul to the other ship. It consists of two wire whips connected at a trolley block.
- B. Messenger - 800 feet of continuous graduated manila or nylon line used to bring the rig aboard.
- C. Winch - The primary source of power for cargo handling and replenishment at sea rigs. Does all the inhaul/outhaul work.
- D. Bolo - A nylon shot line with a padded lead weight. It is used in place of a line throwing gun.
- E. Line throwing gun - Generally an M-14. Fires a projectile from the delivery ship to the receiving ship carrying a light nylon line. The exception to this is aboard aircraft carriers who deliver the projectile to the delivery ship, so as not to strike any aircraft.
- F. P&D line - Phone and Distance line contains a salt and pepper phone line with different colored flags attached to tell the bridge how far apart the ships are during the day. The flags are colored green (00), red (20), yellow (40), blue (60), white (80), repeating out to 300 feet separated by 20 foot increments. At night, chemical lights (clusters of three) mark the 60, 100, 140 and 180 foot markers.

- G. Fair-lead block - Usually a snatch block located at an area where an obstruction is to be bypassed.
- H. Snatch block - A single sheave block with a hinged strap that can be opened and the bight of a line inserted.
- I. King post - One of a pair of short, strong uprights used to support cargo booms and unrep rigs. 1 mainstay and 2 back-stays where delivery ship's stations are located. Most newer combatants have the king post located on the helo-deck or fantail.
- J. Sampson post - Same as King post, except permanently mounted.
- K. Riding lines - Four-inch manila lines about 45 to 60 feet in length used for hogging to prevent double heads from popping out due to weight.
- L. Tiedown lines - Used in securing various rigs and hoses.
- M. Easing out line - A length of line that is secured at one end, with a bight thrown over the hook on the hose and run back to a cleat, allowing the hose to be gently retrieved. Used during high line operations.
- N. Hose saddles - The two types of hose saddles for use with a 7-inch hose are Type A, which is 19 inches long and is used with the single hose rig; and Type B, which is 32 inches long and is used in the upper hose on the two hose rig. Both are flow through hose saddles, so hoses will not kink.
- O. Ram tensioner - Hydraulic device used to keep a constant strain on the span wire. It consists of a ram cylinder, accumulator cylinder, air flasks and an indicator assembly.
- P. Trolley - Connected to hose saddles and rides the span wire; used to bring the hose over.
- Q. STREAM (Standard Transfer REplenishment Alongside Method) - There are two basic STREAM rigs: the surf and concord. They are equipped with two hauling winches and are used for transferring cargo and ammunition.
- R. Cargo drop reel - Device that lowers the load from the tensioned highline allowing the STREAM rigs to be used by ships having only fixed padeyes, a pendant station or support legs. Provided by the delivery ship and is attached to the STREAM trolley.
- S. Sliding padeye - Raises and lowers the attachment padeye, bringing the rig down to the deck. Kitty Hawk has two permanently mounted to the overhead, one in hanger bay 1 and the other in hanger bay 2.
- T. STREAM support leg - Combines the features of a fixed padeye and pendant receiving station. Generally installed on carriers.
- U. End fitting - Any one of numerous fittings used for rig conversion.
- V. Star assembly - An all tensioned wire rig with the highline and the inhaul and outhaul lines being tended by winches in the delivery ship. It is a bell-shaped assembly which is bolted to the traveling surf.
- W. Span wire/highline - $\frac{3}{4}$ -inch diameter galvanized steel wire.
- X. Traveling surf - An all tensioned wire rig with the highline, inhaul/outhaul lines being tended by winches on the delivery ship. (Also called a surf)
- Y. Probe/ROBB coupling - Used to receive fuel. The combined quick release (ROBB) coupling and valve consist of a female and a male end. The male end, rigged on the receiving ship, is the slightly tapered tube with a flange at one end. Despite the name, the ROBB coupling does not qualify as a quick release device, because uncoupling is virtually impossible when the fitting is under strain. Any strain must be taken by the riding line, and to connect or disconnect the ends must be lined up perfectly. To provide for emergency breakaway, a breakable spool is inserted between the receiving ship's manifold and the male end. Only U.S. ships are fitted with the ROBB coupling.

Personnel:

- A. Safety observer (rig and bridge) - Looks for unsafe practices during operations. Uniform consists of a white jersey and helmet with a green cross.
- B. Rig captain - In overall charge of the detail. Uniform consists of a yellow helmet and yellow jersey.
- C. Riggers - Connect and tend tag-lines, prepare for breakaway and disconnect the rig. Uniform consists of a blue helmet and jersey.
- D. Signalman - Receives orders from the rig captain and transmits to the other ship. Uniform consists of a green helmet and jersey.
- E. Corpsman - Maintains watch on station to provide first aid in the event of an injury. Uniform consists of a white helmet and jersey with a red cross.
- F. Gunner's Mate - Mans his station with a line-throwing gun and spare shot lines. Uniform consists of a red helmet and jersey. Operates line-throwing gun.
- G. Winch operator - Maintains even tension on the STREAM line. Uniform consists of a brown helmet and jersey.
- H. Fuelmen - Tests the fuel three times (minimum) during the UNREP for clarity and contamination. Uniform consists of purple helmet and jersey/lifejacket.

Signals and Communication:

- A. One blast - Prepare to fire.
- B. Two blasts - All clear to fire.
- C. Three blasts - Completion of firing.
- D. Flag Signals: The flags of a hoist are always read from the top down. When two or more are flying, they are read from outboard to inboard, or from forward to aft. During unreps, the hoists are displayed on the yardarm toward the rigged ship.
 - 1. Romeo at dip - 3/4 way up toward the point of the hoist. On the control ship, this means: "I am steady on course, speed and am prepared to receive you alongside on side indicated." On the approaching ship, this means: "I am ready to come alongside."
 - 2. Romeo close up - Romeo is at the top of the hoist touching the point of the hoist, or as high as it will go. On the control ship, this means: "I am ready for your approach." On the approach ship, this means: "I am commencing my approach."
 - 3. Romeo hauled down - Means the first messenger is in hand for controlling and receiving ship. Displayed at outboard yardarm.
 - 4. Prep at dip - Expect to disengage in 15 minutes.
 - 5. Prep close up - Replenishment completed and am disengaging at final station.
 - 6. Prep hauled down - Means all lines are clear.
 - 7. Bravo at dip - Displayed where best seen. On the control ship, it means: "I have temporarily stopped supplying." On the receiving ship, it means: "I have temporarily stopped receiving."
 - 8. Bravo close up - On both ships, this means fuel or explosives are being transferred.
 - 9. Bravo hauled down - On both ships, this means delivery is complete.

UNREP Checklist:

- ___ Conduct Steering Checks within past 24 hours
- ___ UNREP brief, ensure know rendezvous point and point is plotted
- ___ Get to UNREP point
- ___ Post fuel type and quantity requirement on bridge
- ___ Set underway replenishment detail (45 minutes prior)
- ___ Confirm all internal nets
- ___ UNREP ship will take tactical control of us
- ___ Take lifeguard station (1000 yards astern)
- ___ Take waiting station (300-500 yards astern)
- ___ Set restricted maneuvering
- ___ Romeo at the Dip: am preparing to receive you alongside
 I am preparing to come alongside
- ___ Romeo Closed Up: I am prepared to receive you alongside
 I am commencing my approach
- ___ Request permission to commence approach after reporting manned and ready to XO
- ___ BMOW: Port Royal is making her approach alongside _____
- ___ Close up Ball-Diamond-Ball
- ___ Request permission to shoot shotlines
- ___ Romeo Hauled Down: Shotline in hand
 Messenger in hand
- ___ Bravo Closed Up: Upon probe seated...receiving fuel
- ___ BMOW passes: The smoking lamp is out while taking on fuel
- ___ Prep at the Dip Fifteen minute Standby
- ___ Prep Closed Up Five minute Standby
- ___ Prep Hauled Down All lines clear
- ___ Play breakaway song, haul down day shapes, secure UNREP detail

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 18

HOURS: 1

TITLE: Naval Command and Control

I. Learning Objectives

- A. The student will know the concept of naval command and control and will be able to define the terms.
- B. The student will know the essential elements of command and control.
- C. The student will know the potential effects of countermeasures against friendly and enemy command and control systems.
- D. The student will know the scope of Navy command and control systems.
- E. The student will be able to discuss the Navy Tactical Data System and the Joint Tactical Data System, and describe the data links associated with these systems.
- F. The student will be familiar with Strike Group operations.

II. References and Texts

A. Instructor references

- 1. Naval Command and Control, Naval Doctrine Publication 6 (Available at: http://www.dtic.mil/doctrine/jel/service_pubs/ndp6.pdf.)
- 2. "Navy," by Gordon I. Peterson (Available at: www.navyleague.org/sea_power/almanac_jan_02_12.php.)
- 3. "A New Idea for a New World," by CDR Steve Richter, Surface Warfare, Fall 2002. (Available at: <http://www.navsea.navy.mil/swmagazine/summarytmp.aspx?iDataPrimeID=492&showmore=true>.)

B. Student texts

- 1. Naval Command and Control, Naval Doctrine Publication 6 (Available at: http://www.dtic.mil/doctrine/jel/service_pubs/ndp6.pdf.)

2. "A New Idea for a New World," by CDR Steve Richter, Surface Warfare, Fall 2002. (Available at <http://www.navsea.navy.mil/swmagazine/summarytmp.aspx?iDataPrimeID=492&showmore=true>.)

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Easel/overhead projector
- C. Video: "Battle Alert in the Gulf," 60 minutes (optional)
- D. VCR/Monitor (optional)

IV. Suggested Methods and Procedures:

- A. Lecture
- B. Discussion

V. Presentation

- A. Show segments of "Battle Alert in the Gulf" (optional).
- B. Define the terms associated with command, control, and communications and explain the concept of command and control.
- C. Command
 1. Control
 2. Communications -- Discussed in Lesson 9.
 3. Strategic
 4. Tactical
- D. Discuss the purpose of command and control.
 1. Generation of target descriptions
 2. Presentation of the tactical situation
 3. Communication of tactical data
- E. Discuss the elements of command and control.
 1. Coordination of forces

2. Information collection
 3. Information management
 - a. Automated data processing
 - b. Combat Direction Systems
 4. Communications
- F. Describe the potential effects of countermeasures against command and control systems.
1. Destruction
 2. Deception
 3. Jamming
 4. Exploitation
- G. Describe the scope of naval command and control systems. Discuss the four forms of command relationships (combatant commands, operational commands, tactical commands, and support).
1. National Command Authority
 2. COMMANDERS AND FLTCOMMANDERS
 3. OTC/Task force/Strike group
 4. Platform commander
- H. Discuss unity of effort -- specifically, the need for the participants to fully understand the overall intent of the commander.
- I. Discuss the importance of decentralization in today's fast-paced warfare environment.
- J. Refer to Naval Command and Control, NDP-6, and "A New Idea for a New World," by CDR Steve Richter, Surface Warfare, Fall 2002. (Available online at: <http://www.navsea.navy.mil/swmagazine/summarytmp.aspx?iDataPrimeID=492&showmore=true>.)
- K. Introduce the Navy Tactical Data System (NTDS) and the Joint Tactical Data System (JTIDS), describe how they have increased the effectiveness of command and control, and list their major capabilities.

1. Discuss the various components of command and control:
 - a. Computers
 - (1) UYK-43
 - (2) TAC-4
 - (3) CDLMS (Common Data Link Management Systems)
 - b. Displays
 - c. Communication facilities
 - d. Data processing and storage equipment
 - (1) Multi-net C2P
 - (2) MIDS
 - e. Input and output devices
2. Discuss the existing networks:
 - a. NTDS
 - b. ACDS (ADVANCED COMBAT DIRECTION SYSTEM)
 - c. ATDS
 - d. MTDS
 - e. JTIDS
3. Describe NTDS and JTIDS data communication links:
 - a. Link 11
 - (1) NLEIP (Link 11 Improvement Program)
 - (2) NILE (NATO Improved Link 11)
 - b. Link 4A
 - c. Link 16
 - d. SATELLITE (S and J - TADIL)

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 19

HOURS: 1

TITLE: Naval Warfare Doctrine Series: Introduction

- I. Learning Objective: The student will know how each of the following components of naval warfare contribute to the basic sea control and power projection mission of the naval service:
- A. Air warfare
 - B. Undersea warfare (including mine warfare and antisubmarine warfare)
 - C. Surface warfare
 - D. Strike warfare
 - E. Amphibious warfare
 - F. C²W (Command and Control Warfare)*
 - G. Mobile logistics support
 - H. Special warfare
 - I. Expeditionary warfare
 - J. C⁴ISR support (command, control, communications, computers, intelligence, surveillance and reconnaissance.)*

*** INSTRUCTOR NOTE:** The PCC's require discussion of Electronic Warfare (EW) and C⁴I warfare. EW and C⁴I warfare have evolved into what Navy and Joint forces call C²W with C⁴ISR support. In this and all other lessons of the Naval Warfare Doctrine series, instructors should discuss current doctrine regarding C²W to include Operations Security (OPSEC), Military Deception, Psychological Operations (PSYOP), EW, and physical destruction mutually supported by C⁴ and ISR assets.

II. References and Texts

- A. Instructor references
 - 1. CNO's Guidance for 2005 (Available at:
<http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)

2. United States Navy's Vision for the Future, 2004
(Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Bush: The Might of Our Navy is Needed Again," by Gordon I. Peterson (Available at:
www.navyleague.org/sea_power/almanac_jan_02_02.php.)
5. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)
6. Forward...From the Sea (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/ffseano.c.html.)
7. ...From the Sea, Preparing the Naval Service for the 21st Century (optional) (Available at:
<http://www.chinfo.navy.mil/navpalib/policy/fromsea/fromsea.txt>.)
8. Naval Doctrine Publication 1, Naval Warfare
(Available at:
www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
9. Naval Doctrine Publication 2, Naval Intelligence
(optional) (Available at:
www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
10. Naval Doctrine Publication 4, Naval Logistics
(optional) (Available at:
www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
11. Naval Doctrine Publication 5, Naval Planning
(optional) (Available at:
www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
12. Naval Doctrine Publication 6, Naval Command and Control (Available at:
www.dtic.mil/doctrine/service_publications_navy_publications.htm.)

B. Student texts

1. CNO's Guidance for 2005 (Available at:
<http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Bush: The Might of Our Navy is Needed Again," by Gordon I. Peterson (Available at:
www.navyleague.org/sea_power/almanac_jan_02_02.php.)
5. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Recommend Part 1, as a minimum.) (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)

III. Instructional Aids:

- A. Chalkboard/Whiteboard
- B. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system

IV. Suggested Methods and Procedures: This lesson serves as an introduction to the follow-on lectures and should "set the tone" for the Naval Warfare Doctrine Series.

- A. Instructional method: It is recommended the series begin with a four-lesson sequence covering the employment of the four major naval warfare communities. Staff members or guest speakers representing the various communities should be the instructors. Following the four-part introductory sequence, a battle problem format should integrate that information into an exposition of the combined warfare concept using a locally developed scenario.

B. Student activity options:

1. Students should be fully involved in the battle problem. The lesson outlines for the battle problem portion of this series will present additional recommendations for student employment.

2. Students can also present the following four lectures -- Surface Warfare, Air Warfare, Submarine Warfare, and Amphibious Warfare. (The Special Operations/Special Warfare lecture is optional.) Presentations should cover the Naval implementation of each warfare area as discussed below.

V. Presentation

- A. This series of doctrine is designed to supplement the concepts taught in the Naval Weapons course. In this series, each of the major warfare communities (surface, air, submarine, and amphibious) will be individually presented and related to each type of warfare listed above.
 1. Current naval doctrine, as provided in Naval Doctrine Publication 1, Naval Warfare, should be introduced during the presentations and referenced throughout the scenario.
 2. Recommend using a joint lecture/discussion for Lessons 20-24.
 - a. Student teams can easily prepare and present this material using the available lesson plans.
 - b. Lectures may be focused one of several ways, including:
 - (1) By platform - Explain platforms/communities, capabilities, weapons systems and missions.
 - (2) By mission - Using the ten warfare concepts listed in the learning objectives (above), explain how each part of a community accomplishes the given mission.
 3. Using a locally developed employment of naval forces scenario, the students may then combine and apply this material in a wartime setting. Upperclassmen who have completed the Weapons class should be placed in "leadership" positions relative to the scenario and provide specific direction for underclassmen who have not yet taken the Weapons class. Specific learning objectives are set forth in the individual lesson guides

listed below:

<u>Lesson</u>	<u>Title</u>	<u>Hours</u>
LESSON GUIDE: 20	Surface Warfare	1
LESSON GUIDE: 21	Spec Ops/Spec Warfare	(.5)
LESSON GUIDE: 22	Air Warfare	1
LESSON GUIDE: 23	Undersea Warfare	1
LESSON GUIDE: 24	Amphibious Warfare	1
LESSON GUIDE: 25	Employment of Naval Forces	1

B. The concepts of expeditionary forces should be emphasized using the current Navy Program Guides, "Sea Power 21," Forward...From the Sea, and "United States Navy's Vision for the Future". Through this series of lessons, the students will understand the following:

1. Naval expeditionary forces:

- a. Are built around fleet operational forces and a forward-deployed Marine Expeditionary Force.
- b. Provide a highly flexible force for a wide range of missions, including long-range strike operations and early forcible entry to facilitate or enable the arrival of follow-on forces.
- c. Have the following characteristics:
 - (1) Swift to respond on short notice to crises in distant lands.
 - (2) Key to our nation's plan for forward presence and crisis response.
 - (3) Structured to build power from the sea when required to support national interests.
 - (4) Able to sustain support for long-term operations.
 - (5) Unrestricted by the need for transit or overflight approval from foreign

governments to reach the scene of action.

2. The three basic concepts of Sea Power 21 and the new Naval Expeditionary Force:

- a. Sea Strike - Projecting precise and persistent offensive power
- b. Sea Shield - Projecting global defensive assurance
- c. Sea Basing - Projecting joint operational independence

C. C⁴ISR concepts should be explained and then referenced and applied in Lessons 20-25.

1. C⁴ISR capabilities enable generation, use, and sharing of knowledge among warfighters throughout the battle space and with the decision makers who guide and support them. C⁴ISR capabilities are more than a collection of hardware and software systems. They are comprised of concepts, operations, people, training, and supporting systems and processes that are essential for achieving battle space dominance. Through application of C⁴ISR capabilities, DoD will dramatically improve information quality and enable comprehensive streamlining of decision-making processes. These capabilities extend from maintaining a useable picture of the battle space to exercising decisive command based on timely situational awareness.

2. C⁴ISR capabilities enable warfighters to understand the threat and the environment; obtain a comprehensive, shared picture of the battle space; exercise decisive command and control of forces; coordinate, order, and direct forces; and monitor and assess actions. C⁴ISR capabilities enable DoD leaders to establish policy and direction; provide the right capabilities, at the right place and time, required to accomplish the mission; and manage and administer the Department effectively and efficiently.

D. C²W concepts should be explained and then referenced and applied in Lessons 20-25.

1. Command and Control Warfare (C²W) comprises actions taken by the military commander to realize

practical effects of Information Warfare on the battlefield.

2. Command and Control (C²) is the exercise of authority and direction by a properly designated commander over assigned or attached forces in accomplishment of the mission. C² functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations necessary for mission accomplishment.
 3. Command and Control Warfare (C²W) is the integrated use of Operational Security (OPSEC), Military Deception (MILDEC), Psychological Operations (PSYOPs), Electronic Warfare (EW), and Physical Destruction, mutually supported by intelligence, to deny information to or to influence, degrade, or destroy adversary command and control capabilities while protecting friendly command and control against such actions.
 4. The goal of C²W is C² superiority/supremacy. While air, land, surface, and subsurface superiority are still essential to successful completion of a campaign in this "age of information," commanders who understand the battle space can react quickly to adversaries' changing windows of vulnerability and thereby gain significant tactical advantage. Therefore, the primary targets for C²W are the decision maker and the decision cycle.
- E. Discuss the changes in deployment structure, including the employment of the Naval Expeditionary Strike Group.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 20

HOURS: 1

TITLE: Naval Warfare Doctrine Series: Surface Warfare

I. Learning Objectives

- A. The student will know and identify major surface warship classes and describe the characteristics and capabilities of their principal weapons/platforms and sensor systems.
- B. The student will know surface warship tactical direction and command and control systems, including the organization of a typical ship's CIC.
- C. The student will know typical employment of various surface vessel classes in support of the following naval warfare components:
 - 1. Air warfare
 - 2. Undersea warfare (including mine warfare and antisubmarine warfare)
 - 3. Surface warfare
 - 4. Strike warfare
 - 5. Amphibious warfare
 - 6. C²W (Command and Control Warfare)
 - 7. Mobile logistics support
 - 8. Special warfare
 - 9. Expeditionary warfare
 - 10. C⁴ISR support (command, control, communications, computers, intelligence, surveillance and reconnaissance.)

II. References and Texts

A. Instructor references

- 1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)

2. United States Navy's Vision for the Future, 2004
(Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)
5. Jane's Fighting Ships (optional)
6. Jane's Naval Weapons Systems (optional)
7. Naval Doctrine Publication 1, Naval Warfare
(Available at:
www.dtic.mil/doctrine/service_publications_navy_pubs.htm.)
8. Sea Power, current Almanac Issue (optional)
(Available at: www.navyleague.org.)
9. The Naval Institute Guide to World Naval Weapons Systems (optional)

B. Student texts

1. CNO's Guidance for 2005 (Available at:
<http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004
(Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)

III. Instructional Aids

- A. Chalkboard/Whiteboard
- B. "Navy Ships" slides (Prepared by instructor to aid students in recognition of different ship types/classes.)
- C. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system or 35mm slides/slide projector
- D. Video: "Warship," 30 minutes (optional)
- E. VCR/Monitor (optional)

IV. Suggested Methods and Procedures

- A. Method Options:
 - 1. This lecture can be presented by the staff surface warfare officer or guest speaker from the surface community using slides and/or segments of the video, as desired.
 - 2. Students may also prepare and present this lecture using the provided lesson guide.
- B. Procedural and student activity options: Students should be directed to study pertinent resources in the unit library to obtain basic familiarity with the subject matter before presentation.

V. Presentation

- A. Discuss the main employment of principal surface warships.
 - 1. Cruiser/Destroyer types
 - 2. Frigates
 - 3. Mine warfare ships
 - 4. Amphibious warfare ships (Introduce only; a detailed discussion is provided in the USMC/Amphibious Warfare course.)
 - 5. Underway replenishment ships
- B. Describe the principal characteristics of the main surface ship sensor(s), weapons, weapons control, and command and control systems and relate them to the ship types above.

- C. Discuss typical employment and tasking of the following surface ship groups, including advantages and disadvantages of each platform under typical employment scenarios encompassed within the scope of the warfare doctrines listed in the learning objectives:
 - 1. Carrier Strike Group/Carrier
 - 2. Expeditionary Strike Group (ESG)
 - 3. Cruiser/Destroyer Squadron
- D. Illustrate the role of naval surface warfare in the following components of naval warfare:
 - 1. Air warfare
 - 2. Undersea warfare (including mine warfare and antisubmarine warfare)
 - 3. Surface warfare
 - 4. Strike warfare
 - 5. Amphibious warfare
 - 6. C²W (Command and Control Warfare)
 - 7. Mobile logistics support
 - 8. Special warfare
 - 9. Expeditionary warfare
 - 10. C⁴ISR support (command, control, communications, computers, intelligence, surveillance and reconnaissance.)

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 21

HOURS: .5

TITLE: Naval Warfare Doctrine Series: Special Operations/Special Warfare

I. Learning Objectives

- A. The student will know and identify subdivisions within the special operations and special warfare communities and describe the varying missions, characteristics and capabilities of each, including principal weapons/platforms and sensor systems.
- B. The student will know typical employment of special operations/special warfare forces in support of the following naval warfare components:
 - 1. Air warfare
 - 2. Undersea warfare (including mine warfare and antisubmarine warfare)
 - 3. Surface warfare
 - 4. Strike warfare
 - 5. Amphibious warfare
 - 6. C²W (Command and Control Warfare)
 - 7. Mobile logistics support
 - 8. Special warfare
 - 9. Expeditionary warfare
 - 10. C⁴ISR support (command, control, communications, computers, intelligence, surveillance and reconnaissance.)

II. References and Texts

- A. Instructor references
 - 1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
 - 2. United States Navy's Vision for the Future, 2004

(Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)

3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" 4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)
5. Sea Power, current Almanac Issue. (Available at:
www.navyleague.org.)
6. "Navy," by Gordon I. Peterson (Available at:
www.navyleague.org/sea_power/almanac_jan_02_12.php.)
7. Naval Doctrine Publication 1, Naval Warfare (Available at:
www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
8. Jane's Fighting Ships (optional)
9. Jane's Naval Weapons Systems (optional)

B. Student texts

1. CNO's Guidance for 2005 (Available at:
<http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)

III. Instructional Aids

A. Chalkboard/whiteboard

- B. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system

IV. Suggested Methods and Procedures

A. Method Options:

1. This lecture can be presented by a guest speaker from the special operations/special warfare community using instructional aids, as desired.
2. Students may also prepare and present this lecture using the provided lesson guide.

- B. Procedural and student activity options: Students should be directed to study pertinent resources in the unit library to obtain basic familiarity with the subject matter before presentation.

V. Presentation

A. Discuss the main employment of special operations/special warfare forces:

1. SEAL Teams
2. Underwater Delivery Vehicles
3. Small Boat Units
4. Repair and Salvage/Repair and Demolition
5. Explosive Ordinance Disposal

- B. Describe the principal characteristics of these operational forces, including team makeup, sensor(s), weapons, and command and control structure.

- C. Discuss typical employment and tasking of the groups above, including advantages and disadvantages of each under typical employment scenarios encompassed within the scope of the warfare doctrines listed in the learning objectives.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 22

HOURS: 1

TITLE: Naval Warfare Doctrine Series: Air Warfare

I. Learning Objectives

- A. The student will know and identify the main aircraft in the U.S. Navy inventory and describe their missions, characteristics, and employment in support of the following naval warfare components:
 - 1. Air warfare
 - 2. Undersea warfare (including mine warfare and antisubmarine warfare)
 - 3. Surface warfare
 - 4. Strike warfare
 - 5. Amphibious warfare
 - 6. C²W (Command and Control Warfare)
 - 7. Mobile logistics support
 - 8. Special warfare
 - 9. Expeditionary warfare
 - 10. C⁴ISR support (command, control, communications, computers, intelligence, surveillance and reconnaissance.)
- B. The student will comprehend the role of naval aviation in the overall strategy of the U.S. Navy.
- C. The student will know the essential elements of command and control relative to naval air assets.
- D. The student will comprehend the tactical employment of aircraft in the offensive and defensive capabilities of a carrier Strike group.
- E. The student will know the typical aviation workup and deployment cycles.

II. References and Texts

A. Instructor references

1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at: <http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at: www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at: www.chinfo.navy.mil/navpalib/cno/proceedings.html.)
5. Naval Doctrine Publication 1, Naval Warfare (Available at: www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
6. Jane's All the World's Aircraft (optional)
7. Jane's Fighting Ships (optional)

B. Student texts

1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at: <http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at: www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at: www.chinfo.navy.mil/navpalib/cno/proceedings.html.)

III. Instructional Aids

A. Chalkboard/whiteboard

- B. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system
- C. VCR/Monitor (optional)
- D. Videos (optional):
 - 1. "The Carrier Battle Group," 20 minutes
 - 2. "Flight Deck (Air Power)," 45 minutes

IV. Suggested Methods and Procedures

- A. Method options:
 - 1. This lecture can be presented by the staff air warfare officer or guest speakers from the naval aviation community. Segments of the videos may be used to present an overview of CV strike group and ESG air operations and footage of flight deck operations.
 - 2. Students may also prepare and present this lecture using the provided lesson guide.
- B. Procedural and student activity options: Students should study pertinent publications in the unit library to obtain basic familiarity with subject matter before presentation.

V. Presentation

- A. Briefly discuss the principal aircraft in the U.S. Navy inventory, their sensors, weapons control systems, and weapons.
- B. Illustrate the role of naval aircraft in the following components of naval warfare:
 - 1. Strike warfare
 - 2. Air warfare/Antimissile defense
 - 3. Surface Warfare
 - 4. Undersea warfare
 - 5. C²W (Command and Control Warfare)
 - 6. Mobile logistics support

7. C⁴ISR support (command, control, communications, computers, intelligence, surveillance and reconnaissance.)
 8. Mine warfare
 9. Mobile logistic support
 10. Special warfare
 11. Expeditionary warfare
- C. Briefly describe the organization of the typical carrier air wing.
 - D. Briefly discuss carrier air wing work-up and deployment cycles.
 - E. Describe the typical VP deployment organization, including mission designation, command, and control.
 - F. Discuss seaborne aviation deployments in units other than aircraft carriers.
 - G. Optional activity: Show video segments, followed by class discussion.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 23

HOURS: 1

TITLE: Naval Warfare Doctrine Series: Undersea Warfare

I. Learning Objectives

- A. The student will know the principal classes of U.S. submarines and comprehend the principle mission area of each.
- B. The student will know the characteristics and capabilities of submarine sensors and weapon systems as security classification permits.
- C. The student will know the role of submarine force units in the support of Navy tactical doctrine in the following warfare areas:
 - 1. Air warfare
 - 2. Undersea warfare (including mine warfare and antisubmarine warfare)
 - 3. Surface warfare
 - 4. Strike warfare
 - 5. Amphibious warfare
 - 6. C²W (Command and Control Warfare)
 - 7. Mobile logistics support
 - 8. Special warfare
 - 9. Expeditionary warfare
 - 10. C⁴ISR support (command, control, communications, computers, intelligence, surveillance and reconnaissance.)

II. References and Texts

- A. Instructor references
 - 1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)

2. United States Navy's Vision for the Future, 2004
(Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)
5. Naval Doctrine Publication 1, Naval Warfare
(Available at:
www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
6. Jane's Fighting Ships (optional)

B. Student texts

1. CNO's Guidance for 2005 (Available at:
<http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004
(Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system
- C. VCR/Monitor (optional)
- D. Videos (optional):

1. "Submarine: Steel Boats -- Iron Men," 57 minutes
(NOTE: Copies of this video are no longer available; however, if a unit still has a copy, it would fit in well with this lesson.)
2. "Fast Attack Submarines of Hampton Roads," 27 minutes

IV. Suggested Methods and Procedures

A. Method options:

1. This lecture can be presented by the staff submarine warfare officer or a guest speaker from the submarine community, using video segments as desired.
2. Students may also prepare and present this lecture using the provided lesson guide.

B. Procedural and student activity options: Students should study pertinent publications in the unit library to obtain basic familiarity with subject matter before presentation.

V. Presentation

- A. Discuss the strategic mission of fleet ballistic submarine units (OHIO CLASS).
- B. Discuss missions of fast-attack submarines (LA, SEAWOLF and VIRGINIA CLASS), including the following employment roles:
 1. Antisubmarine warfare, including direct support operations as part of a strike group
 2. Special warfare support
 3. Strike warfare against land targets
 4. Strategic warfare
 5. C⁴ISR
 6. C²W
 7. Mine warfare
 8. Expeditionary warfare
 9. Amphibious warfare

- C. Discuss submarine sensor, weapons control, and weapons systems as allowed by security classification limits.
- D. Describe typical submarine deployment cycles.
- E. Describe typical submarine tactics for localization and attack.
- F. Optional activity: Show video segments, followed by class discussion.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 24

HOURS: 1

TITLE: Naval Warfare Doctrine Series: Amphibious Warfare

I. Learning Objectives

- A. The student will know how U.S. amphibious operations have historically contributed to control of the seas and the power projection missions of the United States naval services.
- B. The student will comprehend the definition of amphibious assault, the purpose and types of amphibious operations, and the characteristics and capabilities of supporting weapons systems.
- C. The student will comprehend the major doctrinal principles of command, control and planning of amphibious operations.
- D. The student will comprehend the phases of an amphibious operation.
- E. The student will know the organization, capabilities, and the sealift requirements for various sizes of U.S. Marine Corps amphibious organizations.
- F. The student will comprehend the utilization of amphibious operations as an instrument of military strategy in light of current political and strategic considerations.
- G. The student will comprehend the Naval ESG concept and how it fits today's amphibious needs.

II. References and Texts

A. Instructor references

- 1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
- 2. United States Navy's Vision for the Future, 2004 (Available at: <http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
- 3. America's 21st Century Force - Navy Posture

Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)

4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)
5. Naval Doctrine Publication 1, Naval Warfare (Available at:
www.dtic.mil/doctrine/service_publications_navy_pubs.htm.)
6. Jane's Fighting Ships (optional)
7. Joint Publication 3-02, Joint Doctrine for Amphibious Operations (optional) (Available at:
www.dtic.mil/doctrine/jel/new_pubs/jp3_02.pdf or latest edition of Joint Electronic Library CD-ROM.)

III. Student texts

1. CNO's Guidance for 2005 (Available at:
<http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at:
<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at:
www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21 (4-part series), Admiral V. Clark, USN (Available at:
www.chinfo.navy.mil/navpalib/cno/proceedings.html.)

IV. Instructional Aids

- A. Chalkboard/whiteboard
- B. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system
- C. Videos:
 1. "The Gallant Breed: Marines in Combat," Parts I, II, & III, 60 minutes each

2. "Amphibious Operations -- Overview," 40 min (optional)

D. VCR/Monitor

V. Suggested Methods and Procedures

A. Method options

1. This lecture may be presented by the Marine Officer Instructor or guest speaker from the Marine Corps, utilizing video segments to emphasize lecture material.
2. Students may also prepare and present this lecture using the provided lesson guide.
3. Preview video(s).

B. Procedural and student activity options

1. Students should study pertinent publications in the unit library to obtain basic familiarity with subject material before presentation.
2. Student should view selected video clips on their own time prior to presentation.
3. Show video segments to class.
4. Class discussion.

VI. Presentation

A. Present the following information and/or view and discuss selected portions of "The Gallant Breed: Marines in Combat," including additional examples of U.S. amphibious operations. Emphasize how amphibious operations have contributed to:

1. Control of the seas
2. Power projection missions
3. Introduce the Expeditionary Strike Group concept and its role in today's Navy.

B. Discuss the definition of amphibious assault.

1. Present the purposes of amphibious operations.

2. Present the different types of amphibious operations.
- C. Discuss the major principles associated with command, control, and planning of amphibious operations, to include and the evolution of the ESG, Expeditionary Strike Group:
1. Commander Amphibious Task Force (CATF)
 2. Commander Landing Force (CLF)
 3. Combat and Staff Action
 4. Basic decision responsibilities
 5. Supporting arms planning
 6. Logistics and/or combat service support planning
 7. Ship-to-shore movement planning
 8. Transition to command ashore
- D. Discuss the phases of an amphibious operation.
1. Planning
 2. Embarkation
 3. Rehearsal
 4. Movement
 5. Assault
 6. Termination of an amphibious operation
- E. Discuss the basic organization, capabilities, and sealift requirements of:
1. Expeditionary Strike Group (ESG)
 2. Marine Expeditionary Unit (MEU)
 3. Marine Expeditionary Brigade (MEB)
 4. Marine Expeditionary Force (MEF)
- F. Show the "Amphibious Operations -- Overview" video (optional).

- G. Discuss the utility/potential of amphibious operations as an instrument of U.S. military strategy in light of current political and strategic conditions.
1. Transition from lecture to discussion by having the students identify the current political/strategic "hot spots" around the world.
 2. Have the students discuss how amphibious operations might be employed to enhance U.S. control of the seas in these areas.
 3. Have the students identify what types of amphibious operations could be used in a power projection mission or role in these crisis areas.
- H. Discuss the role of Naval warfare disciplines in support of Amphibious Warfare and Expeditionary Operations in the following areas:
1. Air warfare
 2. Undersea warfare (including mine warfare and antisubmarine warfare)
 3. Surface warfare
 4. Strike warfare
 5. C²W (Command and Control Warfare)
 6. Mobile logistics support
 7. Special warfare
 8. C⁴ISR support (command, control, communications, computers, intelligence, surveillance and reconnaissance.)

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 25

HOURS: 1

TITLE: Employment of Naval Forces

I. Learning Objectives

- A. The student will comprehend the basic naval forces employment in a strike group scenario where major naval warfare components are integrated and include:
 - 1. Air warfare
 - 2. Undersea warfare
 - 3. Surface warfare
 - 4. Strike warfare
 - 5. Amphibious warfare
 - 6. Electronic warfare
 - 7. Mobile logistics support
 - 8. Special warfare
 - 9. Expeditionary warfare
 - 10. C⁴I warfare (command, control, communications, computers, and intelligence)/C⁴ISR
 - 11. C²W (Command and Control Warfare)
- B. The student will comprehend Composite Warfare Commander (CWC) concept, the organization of a typical CIC, and their interrelationship in formation maneuvering and in accomplishing the ship's warfare mission.
- C. The student will comprehend the significance of intelligence in the application of naval warfare.
- D. The student will comprehend the stages of a typical engagement sequence from intelligence and warning to final battle damage assessment, and their significance and application to naval warfare.
- E. The student will comprehend the broad tactical implications of the multi-threat environment.

- F. The student will know the concept of naval command and control in the Armed Forces.
- G. The student will know the chain of operational command from the National Command Authority to the platform commander.
- H. The student will know how C⁴I (command, control, communications, computers, and intelligence) applies to missions of sea control and power projection.
- I. The student will know the concept of "expeditionary" forces as it applies to missions of sea control and power projection.

II. References and Texts

A. Instructor references

1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at: <http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at: www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at: www.chinfo.navy.mil/navpalib/cno/proceedings.html.)
5. Naval Doctrine Publication 1, Naval Warfare (Available at: www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
6. Forward...From the Sea (Available at: www.chinfo.navy.mil/navpalib/policy/fromsea/ffseanoc.html.)
7. ...From the Sea, Preparing the Naval Service for the 21st Century (optional) (Available at: <http://www.chinfo.navy.mil/navpalib/policy/fromsea/fromsea.txt>.)
8. Jane's All the World's Aircraft (optional)

9. Jane's Naval Weapons Systems (optional)
10. Joint Publication 6.0, Doctrine for C⁴ Systems Support to Joint Operations (Available at: http://www.dtic.mil/doctrine/jel/new_pubs/jp6_0.pdf or latest edition of Joint Electronic Library CD-ROM.)
11. Naval Doctrine Publication 2, Naval Intelligence (Available at: www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
12. Naval Doctrine Publication 4, Naval Logistics (Available at: www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
13. Naval Doctrine Publication 5, Naval Planning (Available at: www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
14. Naval Doctrine Publication 6, Naval Command and Control (Available at: www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
15. Sea Power, current Almanac Issue (optional) (Available at: www.navyleague.org.)
16. Surface Ship Operations, NAVEDTRA 12973

B. Student texts

1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at: <http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at: www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at:

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Easel
- C. Large size maneuvering boards for layout of dispositions, formations, and airplanes
- D. Navigation charts to allow for briefings
- E. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system

IV. Suggested Methods and Procedures

- A. Method options
 - 1. This lesson presents a simple and basic "big picture" of naval warfare and integrates all the various community warfare doctrines presented prior to this lab session. To accomplish this, the instructor should develop a scenario involving a U.S. Navy force (e.g., a carrier strike group with direct submarine support) in a task operation where opposition is expected. Instructors should exercise care not to emphasize one warfare area over the others. The scenario should be locally developed utilizing staff expertise, experience, and recent world events. This scenario should not be too ambitious, and the total force structure involved should be limited.
 - 2. Recommend instructors pre-brief upperclass midshipmen to ensure respective leadership roles in the laboratory exercise are understood. Emphasize the stages of a typical engagement sequence, planning, and command and control.
 - 3. The next stage is to brief all midshipmen. Staff members should outline the scenario, list the opposing forces, announce the leadership tasking of the midshipman chain of command, and specify objectives for the forces.
- B. Procedural and student activity options
 - 1. Students should have time to study the scenario and assess the capabilities and limitations of forces involved.

2. Within the midshipman chain of command, student task groups should be assigned to all phases of research, planning, and preparation of briefing materials.

3. Midshipmen will present the final briefing.

V. Presentation

- A. This effort may be organized into three phases of which the initial and final phases will be conducted in a lab session.

1. Staff pre-brief (discussed above)

2. Student organization, research, and planning

3. Student presentation followed by staff critiques

- B. Instructors should provide students advice and guidance based on their warfare expertise and assist them in preparing plans and briefing materials.

- C. Student groups should be organized around a combined warfare concept with upperclass midshipmen heading each of the following areas:

1. Combined warfare commander

2. Intelligence and overall concept of operations

3. AAW coordinator

4. ASUW coordinator

5. ASW coordinator

6. Strike coordinator

7. Electronic warfare coordinator

8. Logistics coordinator

9. Amphibious warfare coordinator

- D. Using midshipman leadership and staff guidance, the respective groups should prepare briefing materials to illustrate:

1. Task

2. Concept of operations
 3. Own force structure and intelligence of opponent forces and probable actions
 4. Plans and integrated dispositions of aviation, surface, and submarine assets for offense and defense
 5. Plans for amphibious and strike operations and surface warfare offense/defense
 6. Plans for command, control, and communications
- E. The student presentations should be thorough and may require a full lab period.
1. During the first half of the period, student leaders should present a coordinated briefing illustrating their understanding of the above factors.
 2. To provide students maximum exposure to the many weapons systems, students should be encouraged to ask questions during all phases of the briefings.
 3. In the second part of the lab period, staff members should provide positive but constructive criticism of the student group performance in the technical aspects of their plans and dispositions.
- F. This lesson guide is merely an outline and is not a complete battle problem. Unit staff will need to fully develop the outlined procedures to ensure all learning objectives are met within the allotted time frame.
- G. The sole purpose of the above outline is to provide unit staff with a starting point. Modifications and originality are highly encouraged, as long as all identified learning objectives are met.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 26

HOURS: 1

TITLE: Introduction to Joint Organization and Warfare

I. Learning Objectives

- A. The student will know the missions of the U.S. Army, U.S. Air Force, and U.S. Coast Guard.
- B. The student will explain how and why the Department of Defense was established.
- C. The student will be familiar with the basic functions of the operational and administrative chains of command and distinguish between them.
- D. The student will relate how additional maritime forces (the U.S. Coast Guard and the U.S. Merchant Marine) are brought under military control in wartime.
- E. The student will know the basic concepts and philosophies outlined in Joint Pub 1, being able to describe the nature of American Military Power and identify the values of Joint Warfare.

II. References and Texts

A. Instructor references

- 1. "Future Warfare: America's Military Preparing for Tomorrow" (Available at: [www.dtic.mil/futurejointwarfare/.](http://www.dtic.mil/futurejointwarfare/))
- 2. "Forces to Implement the Defense Strategy," The Bottom-Up Review: Forces for a New Era, by Les Aspin (Available at: [www.fas.org/man/docs/bur/part03.htm.](http://www.fas.org/man/docs/bur/part03.htm))
- 3. Goldwater-Nichols Act of 1986 (Available at: [http://www.jcs.mil/goldwater_nichol_act1986.html.](http://www.jcs.mil/goldwater_nichol_act1986.html))
- 4. "Which Way Joint Doctrine?" by Edward Ferriter (Available at: [www.dtic.mil/doctrine/jel/jfq_pubs/whichwy8.pdf.](http://www.dtic.mil/doctrine/jel/jfq_pubs/whichwy8.pdf))
- 5. "Civilian Control: A National Crisis?" by Mackubin Thomas Owens (Available at: [www.dtic.mil/doctrine/jel/jfq_pubs/jfq1406.pdf.](http://www.dtic.mil/doctrine/jel/jfq_pubs/jfq1406.pdf))

6. Joint Publication 1, Joint Warfare of the Armed Forces of the United States (Available at: www.dtic.mil/doctrine/jel/new_pubs/jp1.pdf or latest edition of Joint Electronic Library CD-ROM.)
7. CJCSI 1800.01 (Series), "Officer Professional Military Education Policy," A-A-1 and A-A-2 (optional)
8. NAVEDTRA 12966, Naval Orientation, Chapter 11 (optional)

B. Student texts

1. "Future Warfare: America's Military Preparing for Tomorrow" (Available at: www.dtic.mil/futurejointwarfare/.)
2. "Forces to Implement the Defense Strategy," The Bottom-Up Review: Forces for a New Era, by Les Aspin (Available at: www.fas.org/man/docs/bur/part03.htm.)
3. "Which Way Joint Doctrine?" by Edward Ferriter (Available at: www.dtic.mil/doctrine/jel/jfq_pubs/whichwy8.pdf.)
4. "Civilian Control: A National Crisis?" by Mackubin Thomas Owens (Available at: www.dtic.mil/doctrine/jel/jfq_pubs/jfq1406.pdf.)

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Overhead projector/instructor prepared transparencies or PowerPoint slides/projection system
- C. Video: "Joint Warfare of the U.S. Armed Forces," 10 minutes (optional)
- D. VCR/Monitor (optional)

IV. Suggested Methods and Procedures

- A. Lecture/Discussions
- B. This lesson should be coordinated with the previous lessons to complement the Naval Warfare Doctrine Series.

V. Presentation

A. Significant dates

- 14 Jun 1775: American Continental Army (now United States Army) was established by the Continental Congress.
- 13 Oct 1775: United States Navy was established.
- 10 Nov 1775: United States Marine Corps was established.
- 18 Sep 1947: United States Air Force was established.
- 1947: Department of Defense was created.
- 1986 Goldwater-Nichols Act of 1986

B. Organization for National Security

1. Pre-1947, there was a Department of War and Department of the Navy. These two organizations were separate entities.
2. National Security Act of 1947
 - a. Established National Security Council. Advises the President regarding the integration of domestic, foreign, and military policy relating to national security.
 - b. Established the Department of Defense, which included three Military Departments (MILDEP) of the Army, Navy (including the United States Marine Corps), and Air Force.
 - c. Established a separate organization of each military under its own Secretary.
 - d. Established unified and specified combatant commands and a clear and direct line of communication.
3. Goldwater-Nichols Act of 1986
 - a. The Goldwater-Nichols Department of Defense Reorganization Act of 1986, sponsored by Sen. Barry Goldwater and Rep. Bill Nichols, caused

a major defense reorganization -- the most significant since the National Security Act of 1947. Operational authority was centralized through the Chairman of the Joint Chiefs as opposed to the service chiefs. The chairman was designated as the principal military advisor to the President, National Security Council and Secretary of Defense. The Act established the position of vice-chairman and streamlined the operational chain of command from the President to the Secretary of Defense to the unified commanders.

- b. Since 1986, Goldwater-Nichols has made tremendous changes in the way DOD operates. Joint operations are the norm (Arabian Gulf, Zaire, Haiti, and Bosnia). Implementation of the Act is an on-going project with Joint Vision 2010 (1996) and Joint Vision 2020 (2000). Both documents emphasize that to be the most effective force, we must be fully joint intellectually, operationally, organizationally, doctrinally, and technically. The joint force, because of its flexibility and responsiveness, will remain the key to operational success in the future.

4. National Command Authority

- a. The President is Commander-in-Chief of the U.S. Armed Forces. He has ultimate authority and responsibility for military decision-making. His principle assistant is the Secretary of Defense. Together, they form what used to be called the National Command Authority (NCA). The President as the Commander-in-Chief and the Secretary of Defense as his 2nd in command exercise command and control over our nation's armed forces. They exercise civilian control over the movement and actions of all military forces.
- b. The President is advised on national security matters by the National Security Council (NSC), consisting of the President, Vice-President, Secretary of State, Secretary of Defense, and National Security Advisor. The council is advised on intelligence matters by the Director of the Central Intelligence

Agency (CIA) and on military matters by the Chairman of the Joint Chiefs of Staff (JCS).

5. Department of Defense

- a. The Secretary of Defense (SECDEF) is responsible to the President for all military matters and is a member of both the Cabinet and the NSC.
- b. DOD was established by the 1949 amendment to the National Security Act of 1947 to direct the three military departments (Army, Navy, and Air Force) and supervise the operational commands of the Armed Forces.
- c. Missions
 - (1) Support and defend the Constitution of the U.S. against all enemies.
 - (2) Protect the U.S., its possessions, and areas vital to its interests.
 - (3) Advance the policies and interests of the U.S.
 - (4) Safeguard the internal security of the U.S.
- d. The Armed Forces' operational and administrative chains of command report to SECDEF.
 - (1) Operational chain of command (combatant commanders or unified commands) -- Responsible for directing and operating military forces in the performance of their missions.
 - (2) Administrative chain of command (CNO, CMC, CSA, CSAF) -- Responsible for ensuring that operating forces are properly prepared for combat and for managing the support structure (e.g., shipyards, naval bases, schools, supply depots, etc.).

6. Joint Chiefs of Staff (JCS)

- a. The JCS act as advisers to the President and the Secretary of Defense. The JCS are

responsible for providing joint strategic and logistic plans, reviewing major material and personnel requirements of the Armed Forces, formulating policies for joint training and military education, and other duties as prescribed by the President or SECDEF. (Only in operational chain of command when directed by the President or Secretary of Defense.)

- b. The Chairman is selected from any service and becomes the ranking military officer of the U.S. Armed Forces. The Chairman serves as principle military adviser to the President, NSC and SECDEF. He/she may transmit communications to the commanders of the combatant commands from the President and the SECDEF, but does not exercise military command over any combatant forces (unified commands).
- c. The Vice-Chairman is the second-ranking member of the JCS and replaces the Chairman in his or her absence or disability. He/she is also selected from any service and is a full voting member.
- d. The senior military officer of each service represents his service on the JCS: Chief of Staff of the Army, Chief of Staff of the Air Force, Chief of Naval Operations, and Commandant of the Marine Corps.

7. Unified Commands

- a. Unified commands, also known as combatant commands, have a broad or continuing mission and are normally organized on a geographical basis (theater) or within a major mission area.
- b. Unified commands are composed of forces from two or more services; all forces not assigned to a combatant command remain in their departments.
- c. Each unified command is headed by a Flag or General Officer, who is directly responsible to the Secretary of Defense. This process maintains civilian control of the military.
- d. Current examples of unified commands:

- (1) Responsible for a geographic region or theatre of operations, e.g., U.S. European Command (USEUCOM), U.S. Central Command (USCENTCOM), U.S. Pacific Command (USPACOM), U.S. Joint Forces Command (USJFCOM), U.S. Southern Command (USSOUTHCOM) and U.S. Northern Command (USNORCOM).
 - (2) Responsible for world-wide functional responsibilities, e.g., U.S. Transportation Command (USTRANSCOM), U.S. Strategic Command (USSTRATCOM), and U.S. Special Operations Command (USSOCCOM).
- e. Each unified command has component commanders from each service who are responsible to the unified commander for the functions performed by their service.
8. Specified Commands: Command with a broad continuing mission normally composed of forces from only one service but may include units and staff representation from other services, e.g. the Strategic Air Command (SAC) and the United States Forces Command (USFORCOM).
9. The military departments are directly responsible to SECDEF for the training, readiness and administration of their respective services (i.e., they head each service's administrative chain of command). Each service secretariat is headed by a civilian secretary, to whom the senior military officer in that service is responsible for the training, readiness and administration of his service. Operational command lies within the Unified Command structure.
 - a. Department of the Army
 - (1) Secretary of the Army
 - (2) Chief of Staff of the Army
 - (3) Mission of the United States Army
 - (a) Strategic instrument of national policy
 - (b) People

- (c) Strategic dominance across the entire spectrum of operations
 - 1. Responsive
 - 2. Deployable
 - 3. Agile
 - 4. Versatile
 - 5. Lethal
 - 6. Survivable
 - 7. Sustainable
- (d) Aspire to be the most esteemed institution in the Nation
- (e) Most respected Army in the world
- (f) Most feared ground force
- b. Department of the Air Force
 - (1) Secretary of the Air Force
 - (2) Chief of Staff of the Air Force
 - (3) Mission of the United States Air Force: Global engagement through a rapid, flexible, and precise response.
 - (4) Air Force Core Competencies are:
 - (a) Aerospace Superiority
 - (b) Global Attack
 - (c) Rapid Global Mobility
 - (d) Precision Engagement
 - (e) Information Superiority
 - (f) Agile Combat Support
- c. Department of the Navy
 - (1) Secretary of the Navy (SECNAV)
 - (2) Chief of Naval Operations (CNO)

- (3) Commandant of the Marine Corps (CMC)
- 10. The Department of Transportation (DOT) and the Department of Homeland Security both control our nation's other maritime assets that can be used for military purposes in wartime:
 - a. The U. S. Coast Guard (USCG)
 - (1) Provides maritime law enforcement and safety, and homeland security of harbors and ports in peacetime.
 - (2) In time of war or national emergency, the President has the authority to place the Coast Guard directly under the Chief of Naval Operations. Operational forces of the USCG, especially aircraft, high endurance cutters, and port security and control forces, would be placed under operational Navy commanders to provide forces for convoy escort, Undersea Warfare (USW), maritime patrol, and port security/control in home waters or abroad.
 - (3) Headed by the Commandant of the Coast Guard.
 - b. The Maritime Administration (MARAD)
 - (1) Headed by the Maritime Administrator, this civilian organization regulates the U.S. shipping industry and maintains shipping reserves for the government in peacetime.
 - (2) In time of war or national emergency, the MARAD organization would be modified to staff the National Shipping Authority (NSA), providing positive control over our nation's shipping assets to ensure they are used as efficiently as possible to support vital military and economic priorities. This is known as Civil Direction of Shipping (CDS).
 - (3) In wartime, ships needed by DOD to provide sealift would be tendered from government- maintained shipping reserves or contracted from private companies to

the MSC. Other shipping assets would remain under private operation but be subject to government direction.

- (4) All U.S.-controlled merchant ships not under direct jurisdiction of the DOD are still subject to Naval Control of Shipping (NCS). NCS allows the Navy to provide the most effective possible protection for merchant ships.

11. Joint Publication 1 and Joint Warfighting

- a. The nature of modern warfare demands that the Armed Forces of the United States fight as a team. In a national emergency, this will include the Coast Guard, NOAA, USPHS, MARAD and the Merchant Marine.
- b. American Military Power
 - (1) Deterrence is our first line of national security. If deterrence fails, our objective is winning the nation's wars.
 - (2) In military operations other than war, our purpose is to promote national security and protect our national interest.
- c. Values in Joint Warfare
 - (1) Integrity: Count on each other to say what we mean and do what we say.
 - (2) Competence: Cement the mutual cohesion between leader and follower.
 - (3) Physical courage
 - (4) Moral courage: This involves the willingness to stand up for what we believe is right, even if that stand is unpopular or contrary to conventional wisdom.
 - (5) Teamwork: The Armed Forces are a team.
 - (6) Trust and confidence
 - (7) Delegation

(8) Cooperation

d. Nine (9) Principles of War

- (1) Mass: Concentrate combat power at the decisive place and time.
- (2) Objective: Direct every military operation toward a clearly defined, decisive, and attainable objective.
- (3) Offensive: Seize, retain, and exploit the initiative.
- (4) Surprise: Strike the enemy at a time, at a place, or in a manner for which he is unprepared.
- (5) Economy of force: Allocate minimum essential combat power to secondary efforts.
- (6) Maneuver: Place the enemy in a position of disadvantage through the flexible application of combat power.
- (7) Unity of Command: For every objective, ensure unity of effort under one responsible commander.
- (8) Security: Never permit the enemy to acquire an unexpected advantage.
- (9) Simplicity: Prepare clear, uncomplicated plans and clear, concise orders to ensure thorough understanding.

e. Fundamentals of Joint Warfare

- (1) Unity of effort
- (2) Concentration of military power
- (3) Seizing and maintaining the initiative
- (4) Agility
- (5) Operations extended to the fullest breadth and depth
- (6) Maintaining freedom of action

- (7) Sustaining operations
- (8) Clarity of expression
- (9) Knowledge of self
- (10) Knowledge of the enemy

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 27

HOURS: 1

TITLE: Joint Organization and Warfare in the 21st Century

I. Learning Objectives

- A. The student will know the relationship between national goals, interests, strategies, policies, and doctrine.
- B. The student will know the primary roles, missions, capabilities, and systems of the U.S. Armed Forces in the 21st century battlespace.
- C. The student will know how other armed services jointly interact with the U.S. Navy.

II. References and Texts

A. Instructor references

- 1. "Future Warfare: America's Military Preparing for Tomorrow" (Available at: [www.dtic.mil/futurejointwarfare/.](http://www.dtic.mil/futurejointwarfare/))
- 2. "Crossing Boundaries: Interagency Cooperation and the Military," by Patrick N. Kelleher, Joint Forces Quarterly, Volume 32, Autumn 2002 (Available at: [www.dtic.mil/doctrine/jel/jfq_pubs/1932.pdf.](http://www.dtic.mil/doctrine/jel/jfq_pubs/1932.pdf))
- 3. "Leadership: Some Thoughts on the Military Circa 2025," by David E. Price, Joint Force Quarterly, Issue 13, Autumn 1996, pp. 97-99 (Available at [www.dtic.mil/doctrine/jel/jfq_pubs/2013.pdf.](http://www.dtic.mil/doctrine/jel/jfq_pubs/2013.pdf))
- 4. "The National Security Strategy of the United States of America" (Available at: [http://www.whitehouse.gov/nsc/nss.html.](http://www.whitehouse.gov/nsc/nss.html))
- 5. "The National Military Strategy of the United States" (Available at: [http://www.defenselink.mil/news/Mar2005/d20050318nms.pdf.](http://www.defenselink.mil/news/Mar2005/d20050318nms.pdf))
- 6. Concept for Future Joint Operations (Available at: [www.dtic.mil/jointvision/history/cfjoprnl.pdf.](http://www.dtic.mil/jointvision/history/cfjoprnl.pdf))
- 7. United States Navy's Vision for the Future, 2004 (Available at:

<http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)

8. Joint Doctrine website (Available at: www.dtic.mil/doctrine/.)
9. Joint Vision 2020 (Available at: www.dtic.mil/jointvision/jvpub2.htm.)
10. Naval Doctrine Publication 1, Naval Warfare (Available at: www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
11. "Military Strategy: Seasons of History," by Neil Howe and William Strauss, Surface Warfare, Volume 22, No. 3, May/June 1997, pp. 36-41 (optional)
12. Joint Publication 1, Joint Warfare of the Armed Forces of the United States (optional) (Available at: www.dtic.mil/doctrine/jel/new_pubs/jp1.pdf or latest edition of Joint Electronic Library CD-ROM)
13. Naval Warfare Doctrine website at: <http://www.nwdc.navy.mil/>

B. Student texts

1. "Future Warfare: America's Military Preparing for Tomorrow" (Available at: www.dtic.mil/futurejointwarfare/.)
2. "Crossing Boundaries: Interagency Cooperation and the Military," by Patrick N. Kelleher, Joint Forces Quarterly, Volume 32, Autumn 2002 (Available at: www.dtic.mil/doctrine/jel/jfq_pubs/1932.pdf.)
3. "United States Navy's Vision for the Future, 2004 (Available at: <http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
4. Joint Doctrine website at: www.dtic.mil/doctrine/
5. Joint Vision 2020 (Available at: www.dtic.mil/jointvision/jvpub2.htm.)
6. Naval Warfare Doctrine website at: <http://www.nwdc.navy.mil/>
7. "Leadership: Some Thoughts on the Military Circa

2025," by David E. Price, Joint Force Quarterly, Issue 13, Autumn 1996, pp. 97-99 (Available at: http://www.dtic.mil/doctrine/jel/jfq_pubs/2013.pdf.)

III. Instructional Aids

- A. Visual display board or chalkboard/whiteboard
- B. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system
- C. Video (optional): "Naval Doctrine Publication #1"
- D. VCR/Monitor (optional)

IV. Suggested Methods and Procedures

- A. Method options
 - 1. Lecture/Discussion
 - 2. This lesson complements Lesson 26, "Introduction to Joint Organization and Warfare." Utilize accordingly.
 - 3. Post-lecture evaluation: Present students with a hypothetical joint operation to support national interests a decade from now. Have students, individually or as teams, draft a list of tasks or actions that may be undertaken by units of the Army, Navy, Marine Corps, and Air Force to accomplish or support the joint operation. Remind the students of the need to observe the emerging operational concepts presented in the lesson. Evaluate for understanding of learning objectives.
- B. Student activity options: Students should be directed to study the designated resources prior to the presentation to obtain basic familiarity with the concepts.

V. Presentation

- A. National goals, interests, and policies
 - 1. The organization of the U.S. Armed Forces is based upon national goals, interests, strategies, policies and doctrines, as well as concepts of warfare that anticipate changing conditions and technologies.
 - 2. National goals

- a. Protection of lives and safety of Americans at home and abroad.
 - b. Maintenance of the political freedom and national independence of the United States, with its values, institutions, and territory intact.
 - c. Provision for the well-being and prosperity of the nation and its people.
- 3. Fundamental national interests are derived from national goals and determine the National Security Strategy (NSS). These interests include:
 - a. Enhancement of national security with effective diplomacy and military force.
 - b. Promotion of U.S. economic prosperity.
 - c. Promotion of democracy abroad.
- 4. National security policies are designed to secure national interests in support of the NSS. Such policies are numerous and are the basis for detailed actions.

B. Military doctrine

- 1. Is based upon warfare concepts and organizational vision, which derive from national goals, interests, and policies.
- 2. Provides broad authoritative guidance to develop and utilize forces.
- 3. Serves as a focus for systems application and technology.
- 4. Fundamentally shapes the way we plan, think, and train for military operations.
- 5. Allows evolution of the doctrine with new operational concepts providing the foundation for change.

C. Joint doctrine documents

- 1. National Security Strategy (NSS) objectives:
 - a. Undivided, democratic, and peaceful Europe

- b. Strong and stable Asia-Pacific community
 - c. U.S. leadership as a force for peace
 - d. Open and competitive trading system
 - e. Cooperation in confronting transnational security threats (i.e., terrorism, drug trafficking, proliferation of weapons of mass destruction)
 - f. Strengthened military and diplomatic means to accomplish these priorities
- 2. National Military Strategy (NMS) objectives set by U.S. Armed Forces in support of the NSS:
 - a. Promote stability
 - b. Thwart aggression
 - c. Accomplished through strategic components:
 - (1) Peacetime engagement
 - (2) Deterrence and conflict prevention
 - (3) Fight and win
- 3. Joint Vision 2020 (JV 2020)
 - a. Conceptual template produced by Chairman, Joint Chiefs of Staff (CJCS), for achieving new levels of effectiveness in joint warfighting by leveraging technological opportunities and innovation and vitality of people serving in the Armed Forces
 - b. CJCS Vision: Quality people trained, equipped, and ready for joint operations
 - (1) Persuasive in peace
 - (2) Decisive in war
 - (3) Preeminent in any form of conflict
- 4. Concept for Future Joint Operations (CFJO)
 - a. First step for implementation of JV 2020
 - b. Based upon joint publications, but calls for

conceptual expansion of JV 2020 into existing doctrines

D. Joint doctrine concepts for 21st century battlespace

1. Missions and tasks of the Armed Forces
 - a. Deter conflict
 - b. Fight and win our nation's wars
 - c. Operations other than war (OOTW)
2. Levels of Warfare
 - a. Strategic
 - b. Operational
 - c. Tactical
3. Power projection, enabled by forward overseas presence, remains the fundamental strategic concept.
 - a. Protects national security interests
 - b. Promotes regional stability
 - c. Builds international confidence in U.S. leadership
4. Emerging operational concepts:
 - a. *Dominant maneuver*: The multidimensional application of information, engagement, and mobility capabilities to position and employ widely dispersed joint air, sea, land, and space forces to accomplish the assigned operational tasks.
 - b. *Precision engagement*: A system, or systems, that enables forces to locate the objective or target, provide responsive command and control, generate the desired effect, assess the level of success, and retain the flexibility to reengage with precision when required.
 - c. *Full-dimensional protection*: The multi-layered offensive and defensive capability to protect forces and facilities at all levels

from adversary attacks while maintaining freedom of action during deployment, maneuver, and engagement.

- d. *Focused logistics:* The fusion of information, logistics, and transportation technologies to provide rapid crisis response to track and shift assets even while enroute, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical levels of operations.

5. Dynamic changes can be expected in:

- a. Enhanced jointness
- b. Multinational operations
- c. Potential adversaries
 - (1) A growing number of adversaries are capable of upsetting existing regional balances of power.
 - (2) Adversaries will have the potential to provide asymmetrical counters to U.S. strengths (i.e., sea and land mines). Asymmetric Warfare is defined as a military term describing warfare in which the two belligerents are mismatched in their military capabilities or their accustomed methods of engagement. In such a situation, the militarily disadvantaged power must press its special advantages or effectively exploit its enemy's particular weaknesses if they are to have any hope of prevailing.
 - (3) The U.S. will face more potential for technological or operational surprise.
- d. Information superiority. The capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same.
 - (1) Ability to determine exact locations of friendly and enemy forces.

- (2) Major improvements in sensors, information collection, analysis, and distribution of data.
 - (3) U.S. forces will gain *dominant battlespace awareness*.
 - e. Technological advances. Adoption of new technologies means military capability improvement, while failure to understand and adapt such advances may lead to premature obsolescence of forces.
- 6. Impacts of technological advances
 - a. Improvement in lethality of weapons use
 - b. More lethal battlespace will increase the importance of:
 - (1) Stealth
 - (2) Mobility
 - (3) Dispersion
 - (4) Higher operational tempo
- 7. Joint operations
 - a. Will no longer rely on massed forces and sequential operations, but will use tailored force applied in parallel to meet mission requirements.
 - b. Use of long-range precision weapons with increased lethality should allow U.S. forces to achieve desired effects with fewer systems and reduced force requirements.
- E. Future capabilities and systems of U.S. Armed Forces
 - 1. Military success in the 21st century will result from technological advances and innovative ways of combining these advances for warfighting.
 - 2. *Defense Technology Objectives (DTOs)*. A system of specific technology advancements that support the four joint operational concepts. Can be Technology Demonstrations (TDs), Advanced Technology Demonstrations (ATDs), or Advanced Concept Technology Demonstrations (ACTDs). The

following are examples of high potential DTOs and the concept they support:

a. Dominant maneuver DTOs:

- (1) Robust Tactical/Mobile Networking
- (2) Rapid Battlefield Visualization ACTD
- (3) Counter-Camouflage Concealment and Deception ATD
- (4) Joint Task Force ATD
- (5) Extending the Littoral Battlespace (Sea Dragon) ACTD
- (6) Joint Countermine ACTD

b. Precision engagement DTOs:

- (1) Precision Signals Intelligence Targeting System
- (2) Arsenal Ship
- (3) Enhanced Fiber-Optic Guided Missile ATD
- (4) Non-Lethal Weapons TD
- (5) Miniaturized Munitions Technology Guided Test Flights

c. Full-dimensional protection DTOs:

- (1) Battlefield Combat Identification
- (2) Military Operations in Urban Terrain
- (3) Miniature Air-Launched Decoy
- (4) Integrated Sensor/Data Fusion TD
- (5) Medical Countermeasures for Encephalomyelitis Viruses

d. Focused Logistics DTOs:

- (1) Airbase/Port Biological Detection ACTD
- (2) Wartime Contingencies and Base Airbase Operations

- (3) Advanced Amphibious Logistics and Seabasing for Expeditionary Force Operations ATD
- (4) Simulation Interconnection
- (5) Affordable, Short-Lead Time Parts Production and Repair

F. Naval interaction with other services

- 1. Each of the armed services are capable of independent operations; but to use all options available in a battlespace, joint operations are normally required and will become more prevalent in the upcoming decades.
- 2. A Joint Task Force Commander tasked with the defeat and occupation of a designated enemy may include many units from several services working together. For example:
 - a. Air Force sensors in space, providing intelligence to the joint staff of a unified area command.
 - b. Army, Navy, Marine Corps, and Air Force special warfare units conducting reconnaissance behind enemy lines.
 - c. Air Force maritime operations against enemy ships.
 - d. Navy and Marine Corps airstrikes coordinated with submarine-launched cruise missile strikes against enemy air-defense system.
 - e. Naval fire support ashore.
 - f. Amphibious landing of Marines from Navy ships and craft.
 - g. Air Force combat airlift and airdrop of Army troops in order to capture an inland enemy airfield.
 - h. Navy Seabees constructing port facilities after beach is secured.
 - i. Navy sealift of Army weapons, vehicles, and supplies to the theater.

- j. Army combat engineers constructing a road to link the port with inland airfield.
- k. Air Force conducting sorties from seized airfield to ensure control of air space dominance over the theater.
- l. Air Force combat support airlift of Army troops into the theater.
- m. Army air-defense artillery units and Naval ships combining capabilities to provide theater ballistic missile defense.
- n. Coast Guard port security units safeguarding harbor facilities against sabotage or attack.
- o. Army helicopters operating from naval ships inducting patrols to locate fast-attack boats attempting to harass U.S. forces.
- p. Combined close-air support for Army armored forces while they move forward to destroy remaining enemy forces.
- q. Army ground forces occupying defeated enemy's cities, establishing military law, and restoring vital utilities and services.

**NAVAL RESERVE OFFICERS TRAINING CORPS
NAVAL OPERATIONS AND SEAMANSHIP**

LESSON GUIDE: 28

HOURS: 2

TITLE: Final Battle Scenario

I. Learning objectives

- A. The student will apply the basic naval forces employment in a strike group scenario where major naval warfare components are integrated and include:
 - 1. Air warfare
 - 2. Undersea warfare
 - 3. Surface warfare
 - 4. Strike warfare
 - 5. Amphibious warfare
 - 6. Electronic warfare
 - 7. Mobile logistics support
 - 8. Special warfare
 - 9. Expeditionary warfare
 - 10. C⁴I warfare (command, control, communications, computers, and intelligence)/C⁴ISR
 - 11. C²W (Command and Control Warfare)
- B. The student will apply Composite Warfare Commander (CWC) concept, the organization of a typical CIC, and their interrelationship in formation maneuvering and in accomplishing the ship's warfare mission.
- C. The student will apply the significance of intelligence in the application of naval warfare.
- D. The student will apply the stages of a typical engagement sequence from intelligence and warning to final battle damage assessment, and their significance and application to naval warfare.
- E. The student will apply the broad tactical implications of the multi-threat environment.

- F. The student will apply concepts of naval command and control in the Armed Forces.
- G. The student will apply the chain of operational command from the National Command Authority to the platform commander.
- H. The student will apply C²W operations as it applies to missions of sea control and power projection.
- I. The student will apply the concept of "expeditionary" forces as it applies to missions of sea control and power projection.

II. References and Texts

A. Instructor references

1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at: <http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at: www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at: www.chinfo.navy.mil/navpalib/cno/proceedings.html.)
5. Naval Doctrine Publication 1, Naval Warfare (Available at: www.dtic.mil/doctrine/service_publications_navy_publications.htm.)
6. Forward...From the Sea (Available at: www.chinfo.navy.mil/navpalib/policy/fromsea/ffseanoc.html.)
7. ...From the Sea, Preparing the Naval Service for the 21st Century (optional) (Available at: <http://www.chinfo.navy.mil/navpalib/policy/fromsea/fromsea.txt>.)
8. Jane's All the World's Aircraft (optional)

9. Jane's Naval Weapons Systems (optional)
10. Joint Publication 6.0, Doctrine for C⁴ Systems Support to Joint Operations (Available at: http://www.dtic.mil/doctrine/jel/new_pubs/jp6_0.pdf or latest edition of Joint Electronic Library CD-ROM.)
11. Naval Doctrine Publication 2, Naval Intelligence (Available at: www.dtic.mil/doctrine/service_publications_navy_pubs.htm.)
12. Naval Doctrine Publication 4, Naval Logistics (Available at: www.dtic.mil/doctrine/service_publications_navy_pubs.htm.)
13. Naval Doctrine Publication 5, Naval Planning (Available at: www.dtic.mil/doctrine/service_publications_navy_pubs.htm.)
14. Naval Doctrine Publication 6, Naval Command and Control (Available at: www.dtic.mil/doctrine/service_publications_navy_pubs.htm.)
15. Sea Power, current Almanac Issue (optional) (Available at: www.navyleague.org.)
16. Surface Ship Operations, NAVEDTRA 12973

B. Student texts

1. CNO's Guidance for 2005 (Available at: <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>.)
2. United States Navy's Vision for the Future, 2004 (Available at: <http://www.chinfo.navy.mil/navpalib/policy/vision/vis04/top-v04.html>.)
3. America's 21st Century Force - Navy Posture Statement 2000 (Available at: www.chinfo.navy.mil/navpalib/policy/fromsea/pos00/pos-top.html.)
4. "Sea Power 21" (4-part series), Admiral V. Clark, USN (Available at: www.chinfo.navy.mil/navpalib/cno/proceedings.html.)

III. Instructional Aids

- A. Chalkboard/whiteboard
- B. Easel
- C. Large size maneuvering boards for layout of dispositions, formations, and airplanes
- D. Navigation charts to allow for briefings
- E. Overhead projector/instructor-prepared transparencies or PowerPoint slides/projection system

IV. Suggested Methods and Procedures

- A. Method options
 - 1. This final battle scenario presents a simple and basic "big picture" of naval warfare and integrates all the various community warfare doctrines presented prior to this lab session. To accomplish this, the instructor should develop a scenario involving a U.S. Navy force (e.g., a carrier strike group with direct submarine support) in a task operation where opposition is expected. Instructors should exercise care not to emphasize one warfare area over the others. The scenario should be locally developed utilizing staff expertise, experience, and recent world events. This scenario should not be too ambitious, and the total force structure involved should be limited.
 - 2. Recommend instructors pre-brief upperclass midshipmen to ensure respective leadership roles in the laboratory exercise are understood. Emphasize the stages of a typical engagement sequence, planning, and command and control.
 - 3. The next stage is to brief all midshipmen. Staff members should outline the scenario, list the opposing forces, announce the leadership tasking of the midshipman chain of command, and specify objectives for the forces.
- B. Procedural and student activity options
 - 1. Student should have time to study the scenario and assess the capabilities and limitations of forces involved.

2. Within the midshipman chain of command, student task groups should be assigned to all phases of research, planning, and preparation of briefing materials.
3. Midshipmen will present the final briefing.

V. Presentation

- A. This effort may be organized into three phases of which the initial and final phases will be conducted in a lab session.
 1. Staff pre-brief (discussed above)
 2. Student organization, research, and planning
 3. Student presentation followed by staff critiques
- B. Instructors should provide students advice and guidance based on their warfare expertise and assist them in preparing plans and briefing materials.
- C. Student groups should be organized around a combined warfare concept with upperclass midshipmen heading each of the following areas:
 1. Combined warfare commander
 2. Intelligence and overall concept of operations
 3. AAW coordinator
 4. ASUW coordinator
 5. ASW coordinator
 6. Strike coordinator
 7. C²W commander
 8. Logistics coordinator
 9. Amphibious warfare coordinator
- D. Using midshipman leadership and staff guidance, the respective groups should prepare briefing materials to illustrate:
 1. Task
 2. Concept of operations

3. Own force structure and intelligence of opponent forces and probable actions
 4. Plans and integrated dispositions of aviation, surface, and submarine assets for offense and defense
 5. Plans for amphibious and strike operations and surface warfare offense/defense
 6. Plans for command, control, and communications
- E. The student presentations should be thorough and may require a full lab period.
1. During the first half of the period, student leaders should present a coordinated briefing illustrating their understanding of the above factors.
 2. To provide students maximum exposure to the many weapons systems, students should be encouraged to ask questions during all phases of the briefings.
 3. In the second part of the lab period, staff members should provide positive but constructive criticism of the student group performance in the technical aspects of their plans and dispositions.
- F. This lesson guide is merely an outline and is not a complete battle problem. Unit staff will need to fully develop the outlined procedures to ensure all learning objectives are met within the allotted time frame.
- G. The sole purpose of the above outline is to provide unit staff with a starting point. Modifications and originality are highly encouraged, as long as all identified learning objectives are met.
- H. Additionally, this lesson should reference Lab 25, "Employment of Naval Forces."